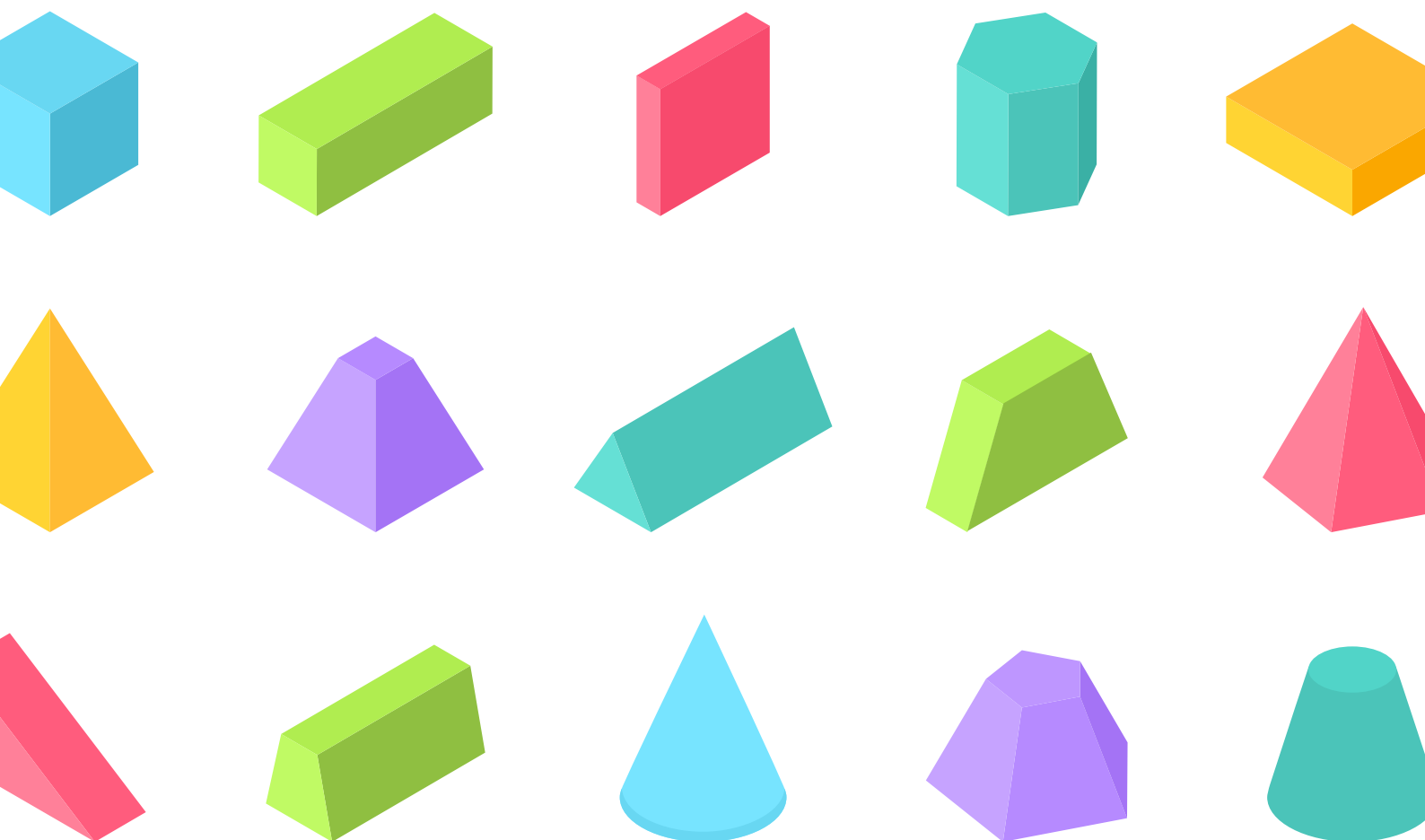


Eduqas GCSE Mathematics Foundation Tier

Geometry and Measure Revision Booklet



The questions included in this booklet have been taken from past examination papers used in previous Eduqas examinations.



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Please note that any questions labelled as “Calculator” have been taken from an exam paper where the use of a calculator was allowed. This does not necessarily mean that a calculator is required to answer the question.

Properties of 2D / 3D Shapes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
Total	4	

#1

The diagram shows a parallelogram, $ABCD$ and the diagonal AC .

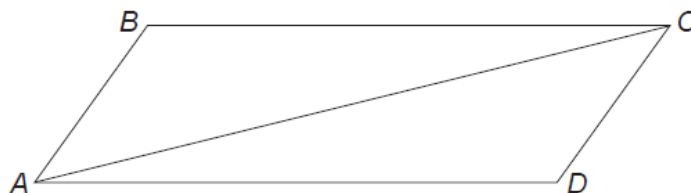


Diagram not drawn to scale

Tick (✓) the **two** correct statements.

[2]

$\hat{ABC}$ is not equal to $\hat{CDA}$	
$AB = DC$ and $AD = BC$ and AC is a side of both triangle ABC and triangle CDA	
Triangle ABC is similar to triangle CDA with enlargement scale factor 0.5	
Triangle ABC is not congruent to triangle CDA	
Triangle ABC is congruent to triangle CDA	
AB represents the shortest distance from B to AC	

Question taken from Eduqas examination paper 530001, May 2022

#2

(a) A 3D shape has

- 12 edges
- 4 rectangular faces and
- 2 square faces.

(i) What is the name of this 3D shape?

[1]

.....

(ii) How many vertices does the 3D shape have?

[1]

.....

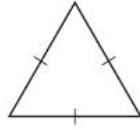
Question taken from Eduqas examination paper 530001, June 2018

Properties of 2D / 3D Shapes: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	1	
#3	2	
#4	3	
#5	3	
#6	4	
#7	4	
Total	18	

#1

- (a) The diagram below shows a triangular tile.



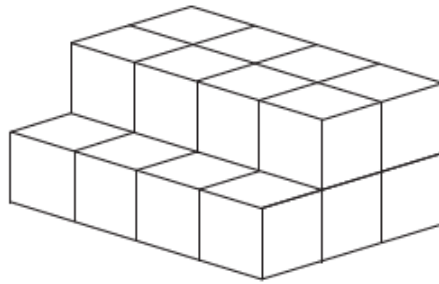
What is the mathematical name of the triangle used for the tile?

[1]

Question taken from Eduqas examination paper 530002, June 2018

#2

- (a) This solid prism is made from identical cubes. Each cube has sides of length 1 cm.

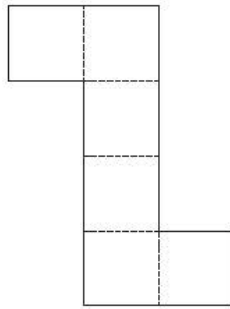


Give the dimensions of a cuboid that could be made with the same number of cubes. [1]

Question taken from Eduqas examination paper 530002, November 2020

#3

(a) The diagram shows a 2D shape made from squares.

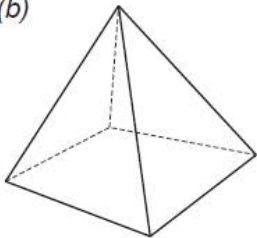


This shape is folded along each dotted line to make a 3D shape.

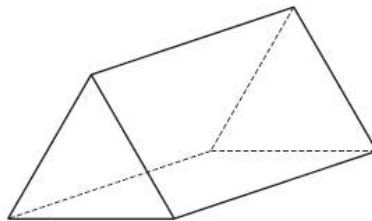
Write down the name of this 3D shape.

[1]

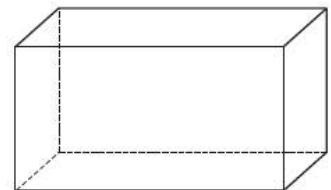
(b)



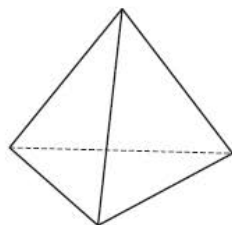
A



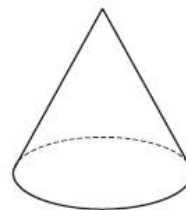
B



C



D



E

Which of the 3D shapes drawn above has 5 faces, 9 edges and 6 vertices?

Tick (✓) **one** box.

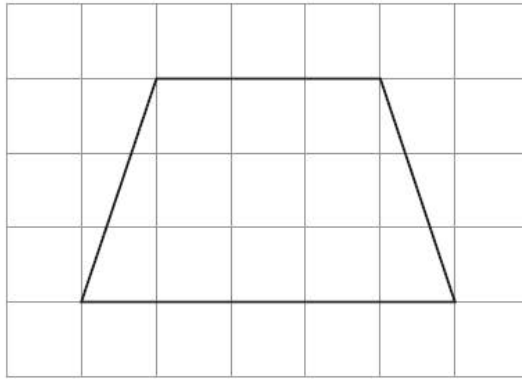
[1]



Question taken from Eduqas examination paper 530002, November 2019

#4

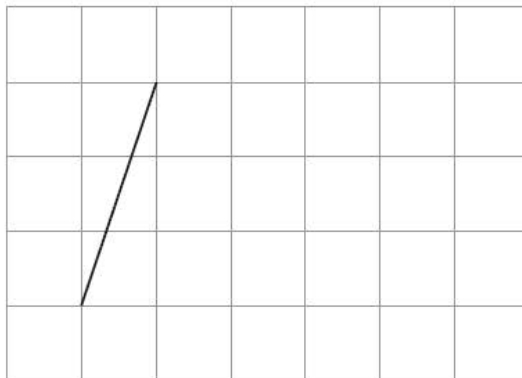
(b) The diagram below shows a quadrilateral on a grid.



(i) What is the special name of this quadrilateral?

[1]

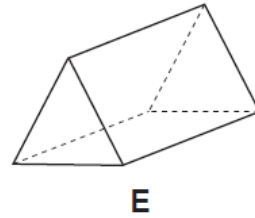
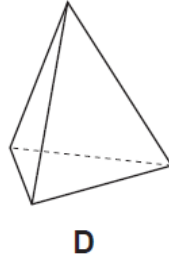
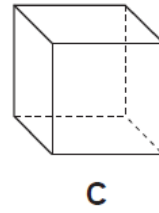
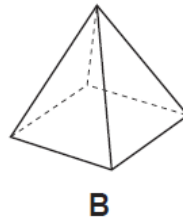
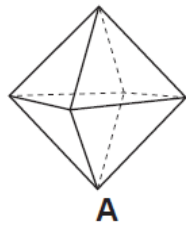
(ii) On the grid below, complete the drawing of a parallelogram that has the same area as the quadrilateral drawn above. [2]



Question taken from Eduqas examination paper 530002, November 2018

#5

(b) Some three-dimensional shapes are shown below.

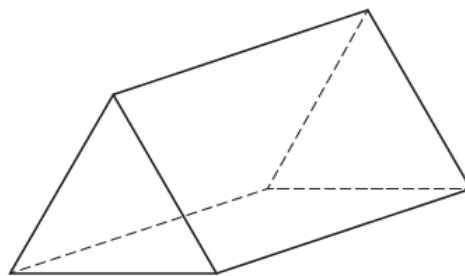
Complete the following sentences using **A**, **B**, **C**, **D** or **E**.

- (i) Shape has twice as many edges as it has faces. [1]
- (ii) Shape has twice as many edges as it has vertices. [1]
- (iii) The number of vertices is equal to the number of faces in shapes and [1]

Question taken from Eduqas examination paper 530002, November 2024

#6

(c) The diagram below shows a triangular prism.

*Diagram not drawn to scale*

How many edges and vertices does the triangular prism have? [2]

Edges Vertices

- (d) Draw one line to connect each of the following mathematical names to the correct shape.
You will not need to use every shape. One has been completed for you. [2]

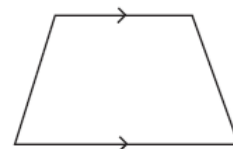
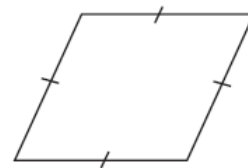
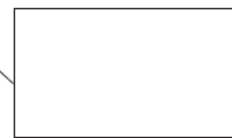
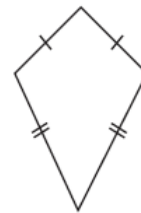
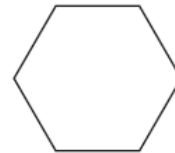
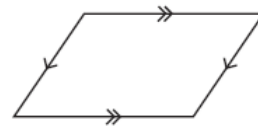
Rectangle

Rhombus

Trapezium

Kite

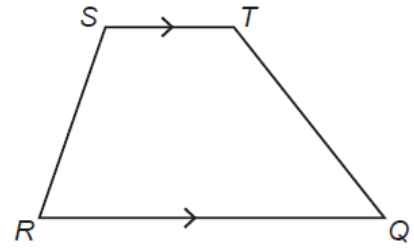
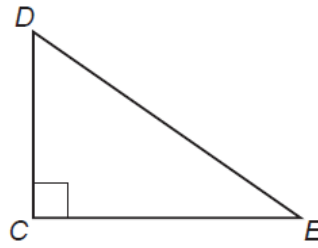
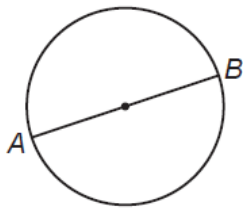
Hexagon



Question taken from Eduqas examination paper 530002, June 2023

#7

- (b) A circle, a right-angled triangle and a trapezium are shown below.



circumference

parallel

tangent

isosceles

perimeter

radius

perpendicular

diameter

Use the correct words from the list above to complete each of the following sentences.

- (i) The line AB is a [1]

- (ii) The lines CD and CE are [1]

- (iii) The lines ST and RQ are [1]

- (c) Sadia describes a 3D shape.
She says,

This 3D shape has 5 vertices, 8 edges and 5 faces.

Which one of the 3D shapes listed below could be the one Sadia is describing?

Circle your answer.

[1]

cuboid

triangular prism

cube

square-based pyramid

cone

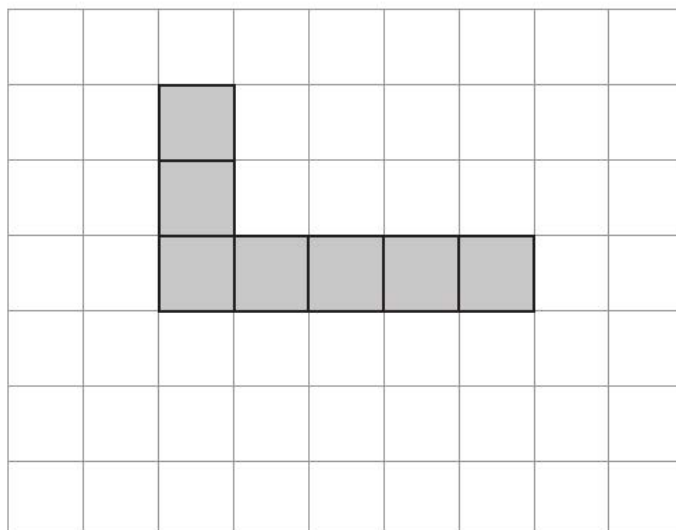
Question taken from Eduqas examination paper 530002, June 2024

Symmetry / Rotational Symmetry: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
Total	3	

#1

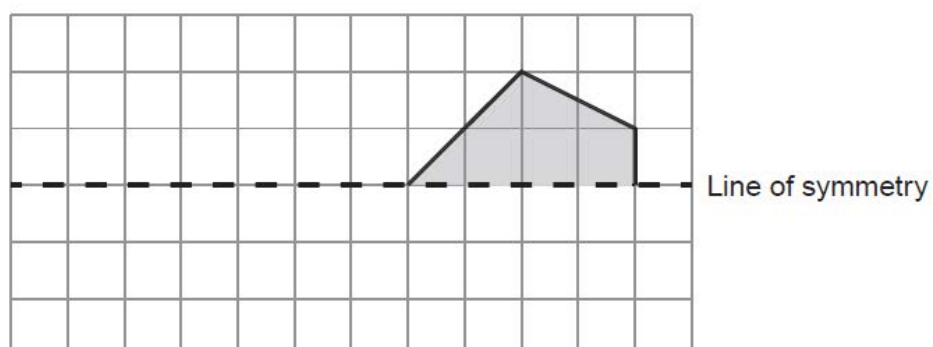
- (a) Shade **two** more squares so that this shape has rotational symmetry of order 2. [1]



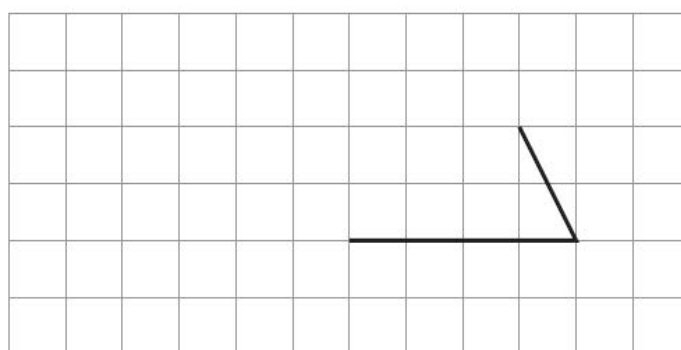
Question taken from Eduqas examination paper 530001, November 2019

#2

- (a) Draw the reflection of the shape below in the line of symmetry. [1]



- (b) Add two more lines to complete the shape below so that it is a quadrilateral with rotational symmetry of order 2. [1]



Question taken from Eduqas examination paper 530001, November 2018

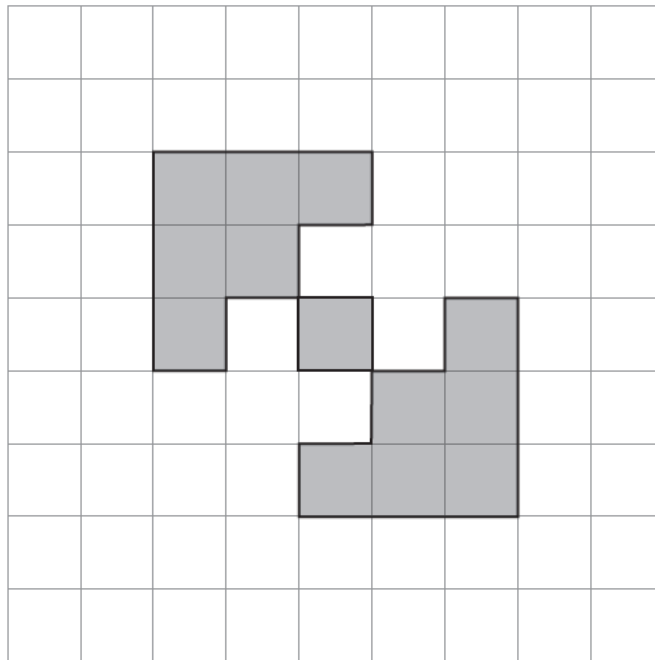
Symmetry / Rotational Symmetry: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	3	
Total	7	

#1

(d) Mark all the lines of symmetry on the following diagram.

[2]

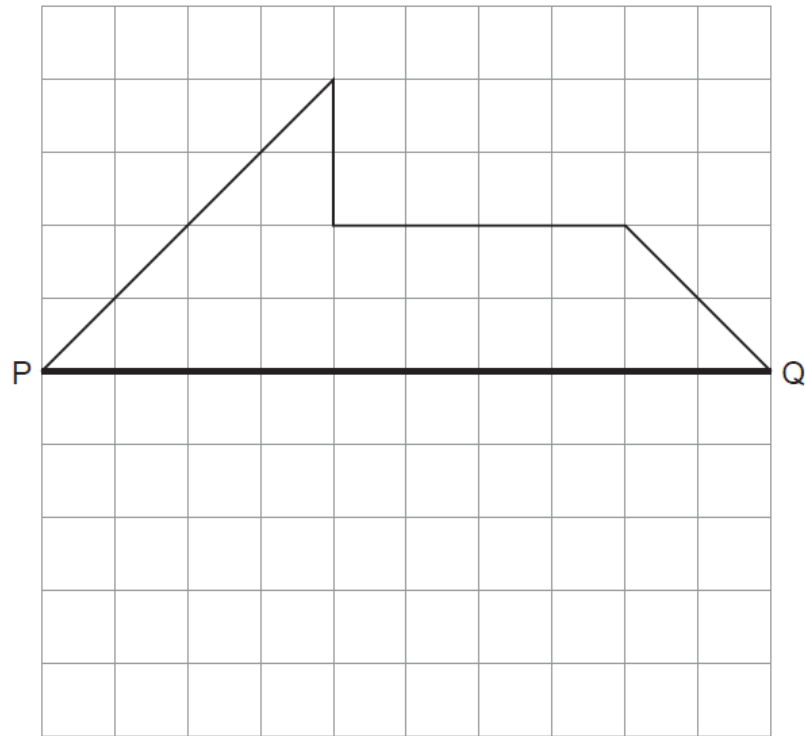


Question taken from Eduqas examination paper 530002, June 2024

#2

- (a) Complete the shape so that PQ is a line of symmetry.

[1]



- (c) Circle the shape below that has rotational symmetry of order three.

[1]



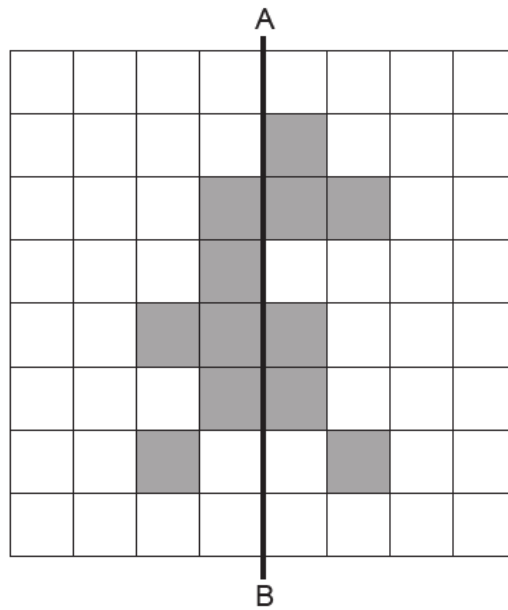
Question taken from Eduqas examination paper 530002, November 2024

#3

- (a) Complete the pattern below so that AB is a line of symmetry.

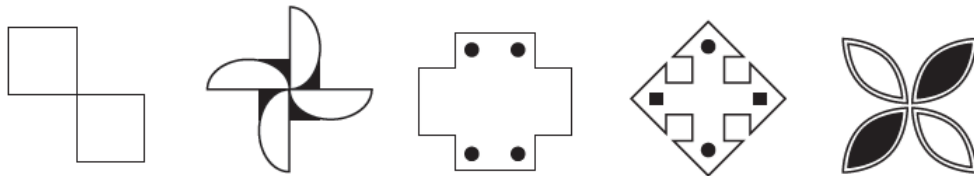
Shade the smallest possible number of squares.

[2]



- (b) Circle the shape below that has rotational symmetry of order 4.

[1]



Question taken from Eduqas examination paper 530002, June 2023

Angles Properties: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
#3	4	
#4	5	
#5	5	
Total	22	

#1

(a)

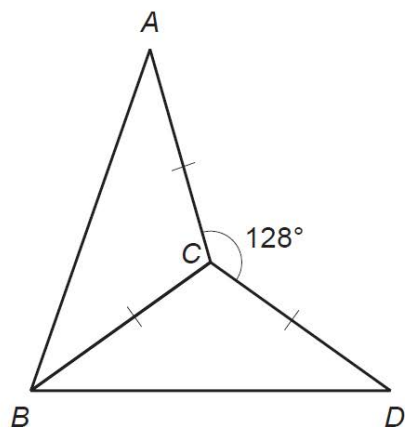


Diagram not drawn to scale

The diagram shows two triangles ABC and BDC .
These triangles are both congruent and isosceles.

Find the size of $\hat{BAC}$.

[4]

.....

.....

.....

.....

.....

.....

$\hat{BAC}$ $^{\circ}$

Question taken from Eduqas examination paper 530001, November 2018

#2

The diagram shows an **equilateral** triangle, PQR , inside a rectangle, $PSTU$.
 Q is on side PS of the rectangle.

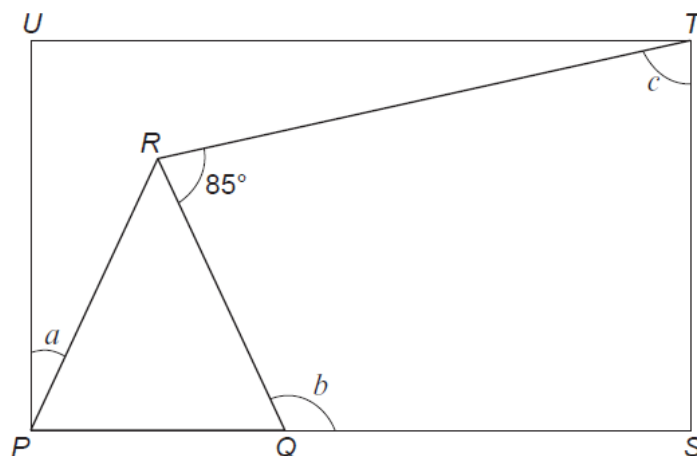


Diagram not drawn to scale

Calculate the size of each of the angles, a , b and c .

[4]

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$a =$ $^\circ$, $b =$ $^\circ$, $c =$ $^\circ$

Question taken from Eduqas examination paper 5300001, November 2021

#3

In the diagram below, BE is a straight line.

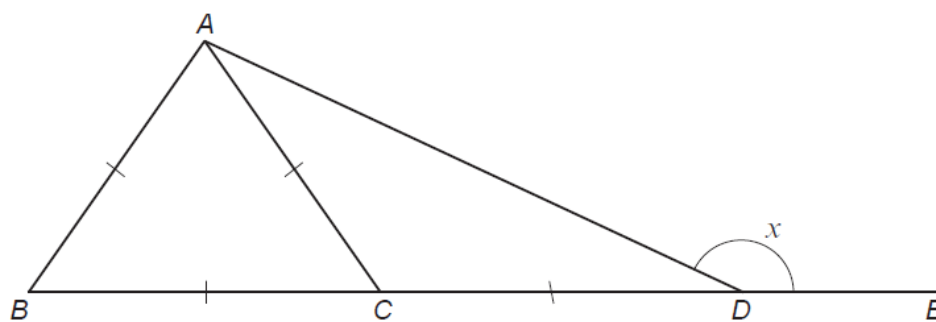


Diagram not drawn to scale

Show that $x = 150^\circ$.

You must give a reason for each step of your working.

[4]

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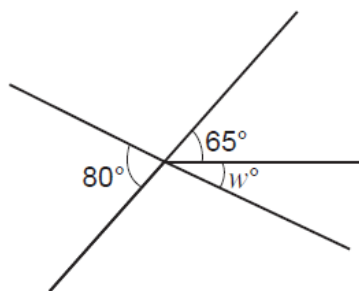
.....

.....

Question taken from Eduqas examination paper 530001, May 2024

#4

(a)

Diagram not
drawn to scaleFind the value of w .

[2]

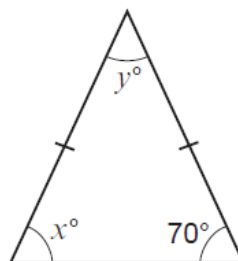
.....

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.....

 $w =$

(b)

Diagram not
drawn to scale

The diagram shows an isosceles triangle.

Find the value of x and the value of y .

[3]

.....

.....

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.....

.....

 $x =$ $y =$

Question taken from Eduqas examination paper 530001, November 2022

#5

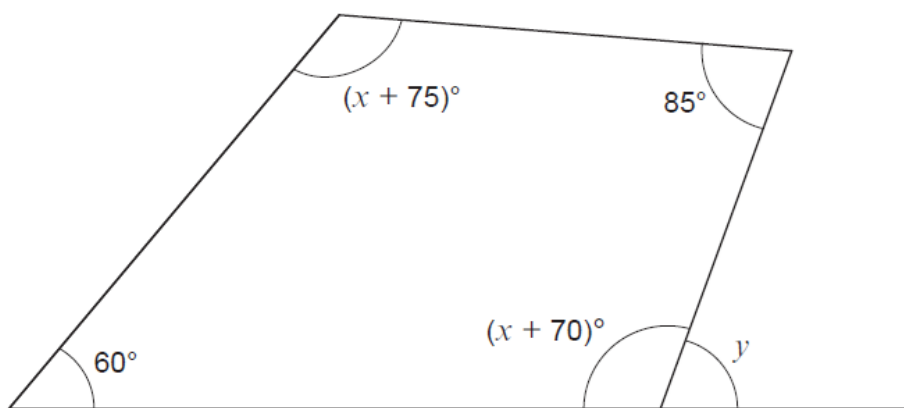


Diagram not drawn to scale

The diagram shows a quadrilateral.

Use algebra to find the size of the exterior angle y .

[5]

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$$y = \text{.....}^\circ$$

Question taken from Eduqas examination paper 530001, May 2023

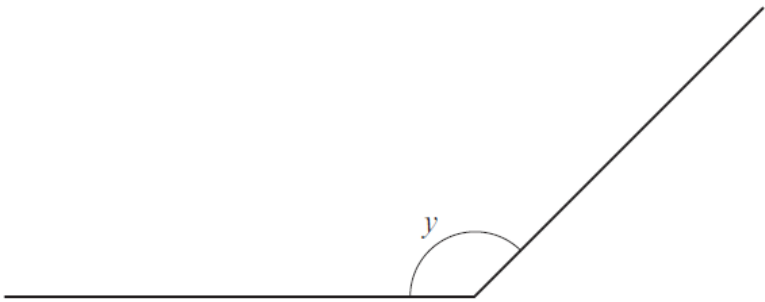
Angles Properties: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	3	
#3	3	
#4	4	
#5	4	
#6	4	
#7	5	
#8	6	
Total	30	

#1

(a) Measure and write down the size of angle y .

[1]



$y = \text{.....}^\circ$

Question taken from Eduqas examination paper 530002, June 2024

#2

(d) Find the size of each of the angles x and y .

[3]

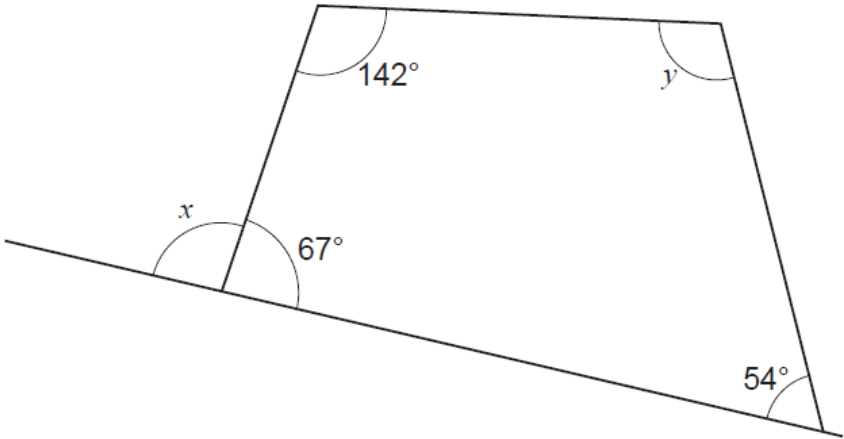


Diagram not drawn to scale

.....

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.....

.....

$x = \text{.....}^\circ$ $y = \text{.....}^\circ$

Question taken from Eduqas examination paper 530002, November 2024

#3

The diagram shows three **identical** squares.

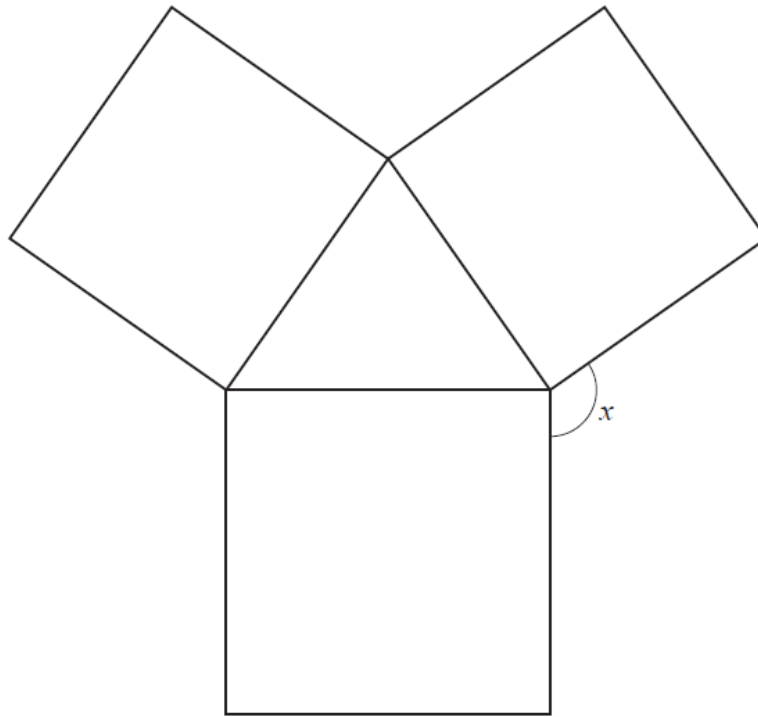


Diagram not drawn to scale

Calculate the size of angle x .

[3]

.....

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.....

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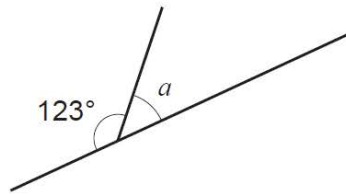
$x = \text{.....}^\circ$

Question taken from Eduqas examination paper 530002, June 2023

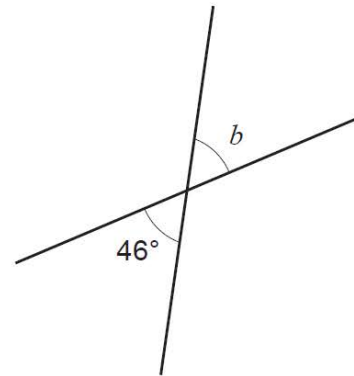
#4

(a) Find the size of each of the angles marked a , b and c .

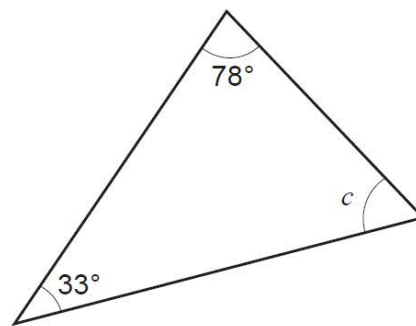
[4]



$$a = \dots\dots\dots^\circ$$



$$b = \dots\dots\dots^\circ$$



$$c = \dots\dots\dots^\circ$$

Diagrams not drawn to scale

.....

.....

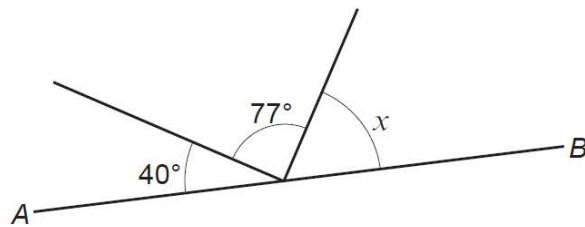
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Question taken from Eduqas examination paper 530002, June 2019

#5

(a)

*Diagram not drawn to scale*

AB is a straight line.

Calculate the size of angle x .

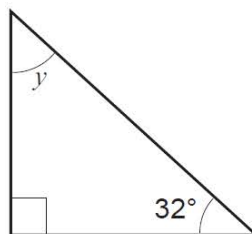
[2]

.....

.....

$$x = \text{.....}^\circ$$

(b)

*Diagram not drawn to scale*

Calculate the size of angle y .

[2]

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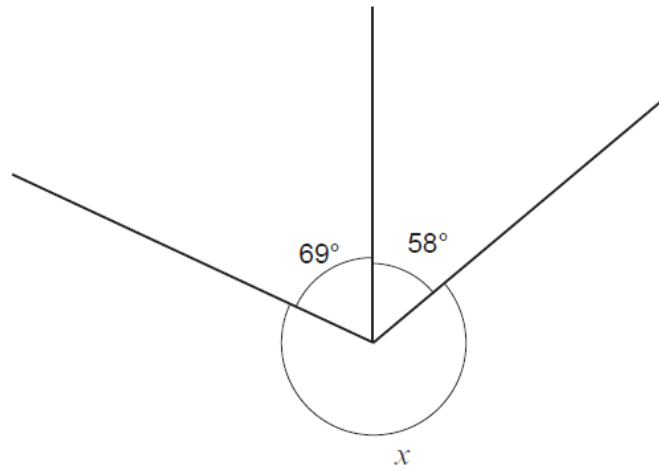
.....

$$y = \text{.....}^\circ$$

Question taken from Eduqas examination paper 530002, November 2020

#6

(a)

*Diagram not drawn to scale*Calculate the value of x .

[2]

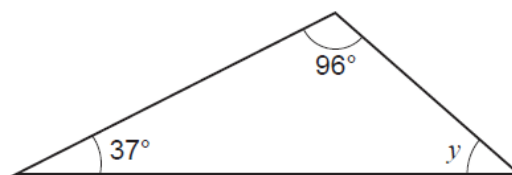
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$$x = \text{.....}^\circ$$

(b)

*Diagram not drawn to scale*Calculate the value of y .

[2]

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$$y = \text{.....}^\circ$$

Question taken from Eduqas examination paper 530002, November 2021

#7

$ABCD$ is a parallelogram.

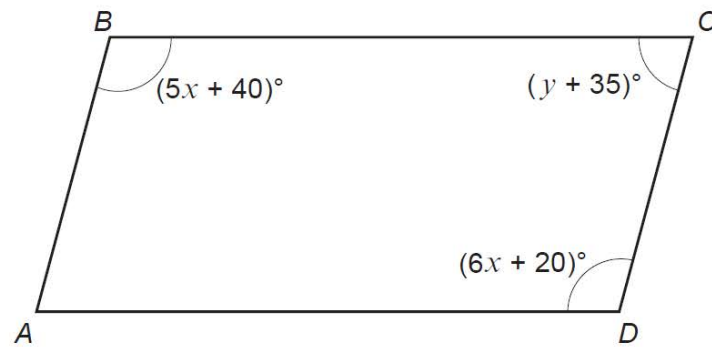


Diagram not drawn to scale

Work out the value of x and the value of y .
You must show all your working.

[5]

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$x =$ $y =$

Question taken from Eduqas examination paper 530002, November 2020

#8

(a) Find the size of each of the angles marked a , b and c .

[4]

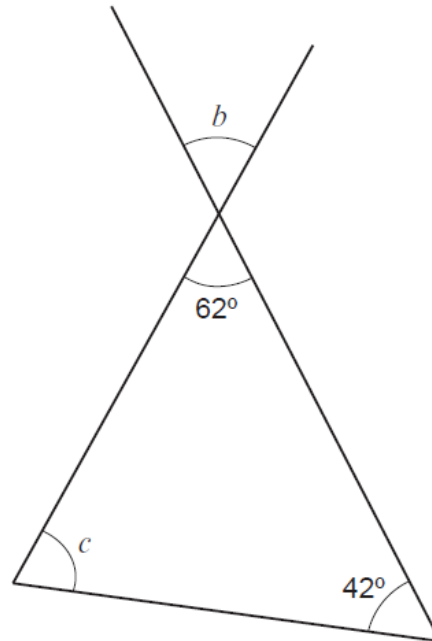
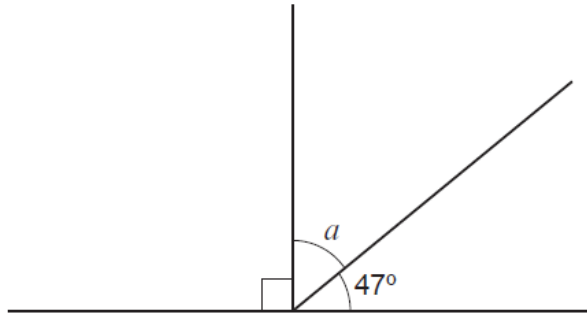


Diagram not drawn to scale

 $a = \dots\dots\dots^\circ$ $b = \dots\dots\dots^\circ$ $c = \dots\dots\dots^\circ$

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- (b) The interior angles of a triangle are 65° , 65° and 50° .

Circle the correct mathematical name of this triangle.

[1]

Equilateral

Right-angled

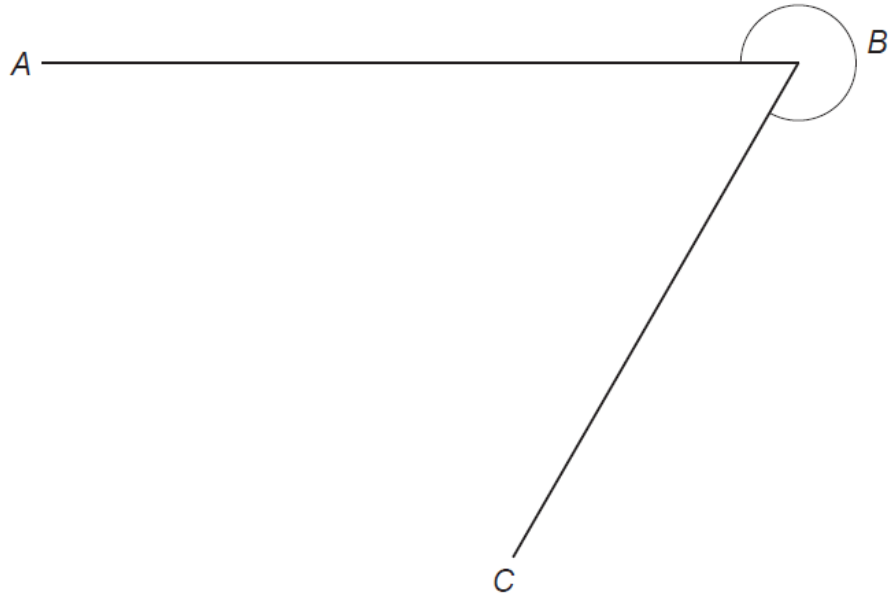
Isosceles

Obtuse-angled

Scalene

- (c) Measure the size of the reflex angle ABC shown below.

[1]



Reflex angle $ABC = \dots\dots\dots^\circ$

Question taken from Eduqas examination paper 530002, June 2022

Angles on Parallel Lines: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	5	
#5	6	
Total	22	

#1

(b)

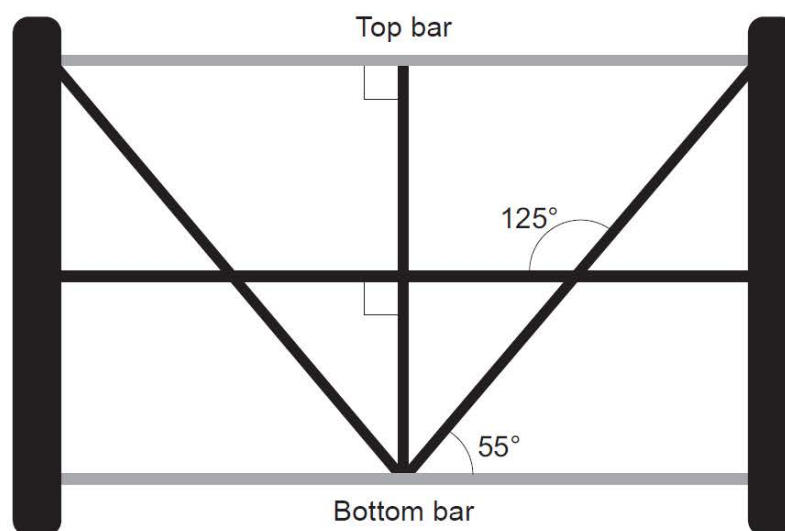


Diagram not drawn to scale

The diagram shows part of a garden gate made from straight metal bars.

Show that the top bar is parallel to the bottom bar.

Label the diagram with any angles you use. Give a reason for each step.

[3]

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Question taken from Eduqas examination paper 530001, November 2018

#2

In the diagram, ABC is a triangle.
 BC is parallel to DEF .
 AEB and AFC are straight lines.

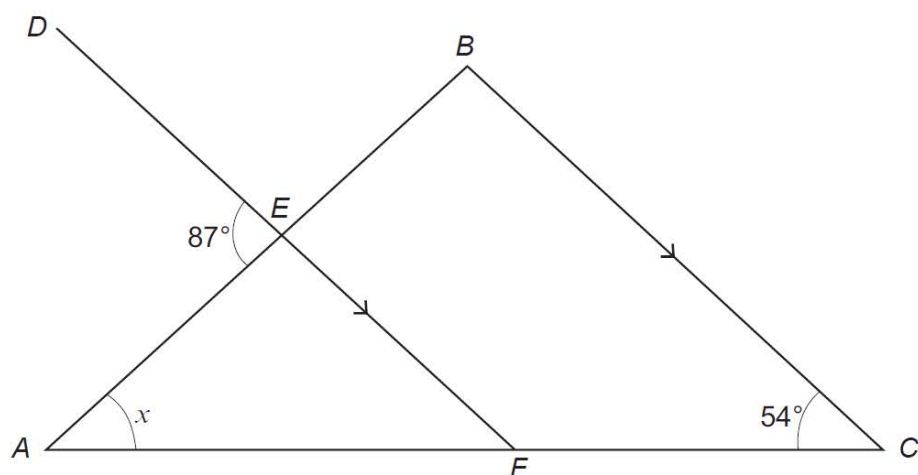


Diagram not drawn to scale

Show that $x = 33^\circ$.

You must give a reason for each step of your working.

[4]

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Question taken from Eduqas examination paper 530001, June 2018

#3

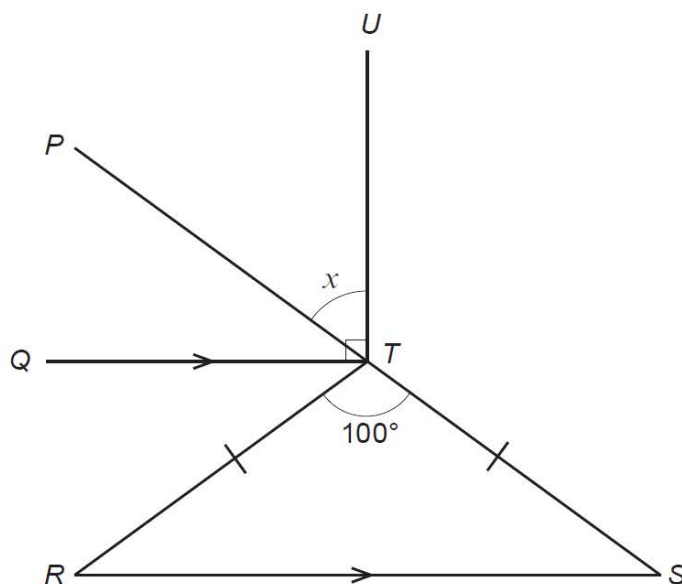


Diagram not drawn to scale

Show that $x = 50^\circ$.

Give a reason for each step of your answer.

[4]

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Question taken from Eduqas examination paper 5300001, June 2019

#4

The diagram shows a ship's journey from P to Q to R .

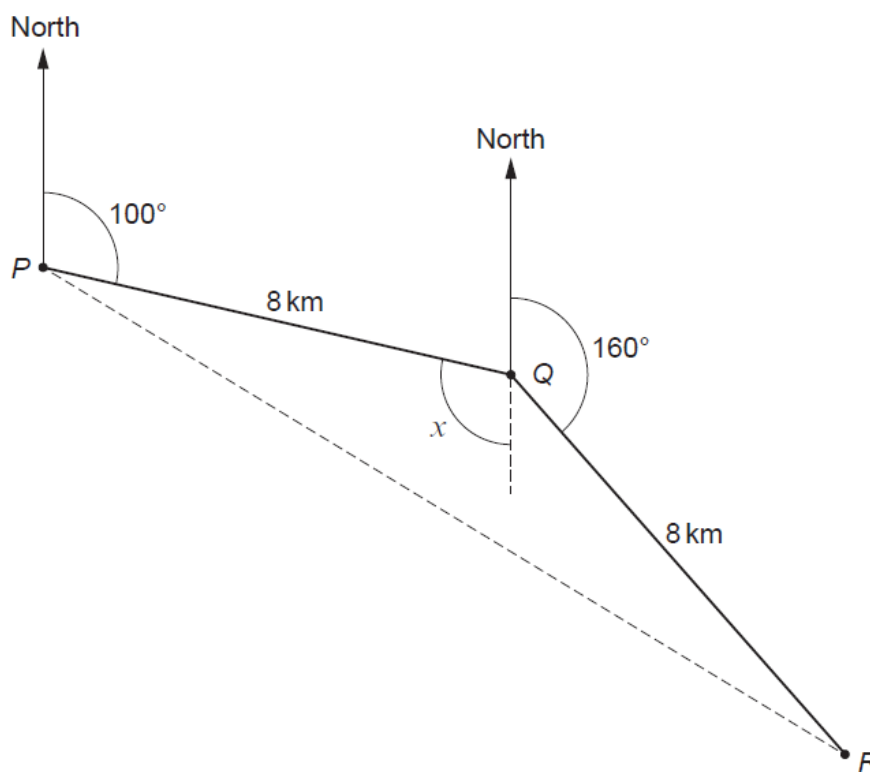


Diagram not drawn to scale

The ship travels on a bearing of 100° for 8 km from P to Q .
It then travels on a bearing of 160° for 8 km from Q to R .

- (a) Explain why the angle x is 100° . [1]

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- (b) Work out the bearing of R from P .
Give a reason for each step of your answer. [4]

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Question taken from Eduqas examination paper 530001, May 2022

#5

(a)

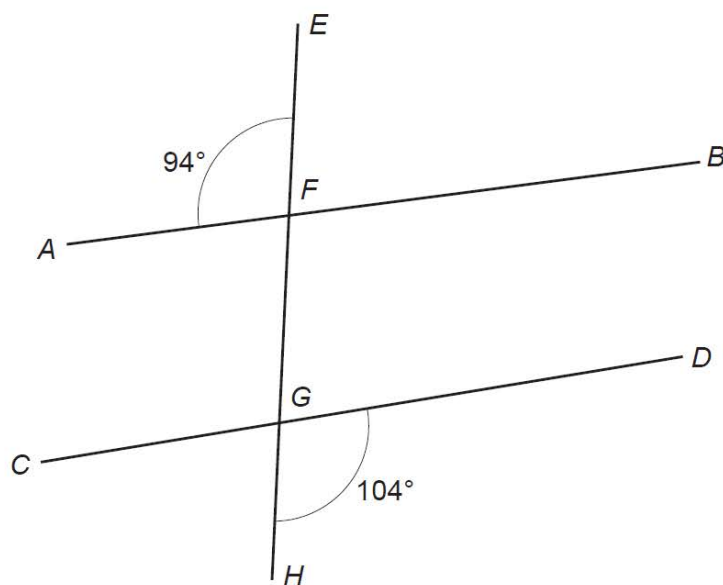


Diagram not drawn to scale

Show that AB and CD are **not** parallel.
Give a reason for each step of your answer.

[2]

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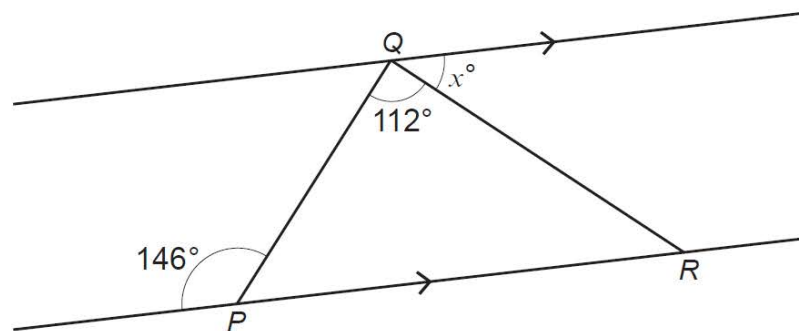
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(b)

*Diagram not drawn to scale*

- (i) Calculate the value of x .
Give reasons and calculations to support your answer.

[3]

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$$x = \text{.....}^\circ$$

- (ii) Write down the mathematical name for triangle PQR .
Give a reason for your answer.

[1]

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Question taken from Eduqas examination paper 530001, November 2020

Angles on Parallel Lines: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
Total	8	

#1

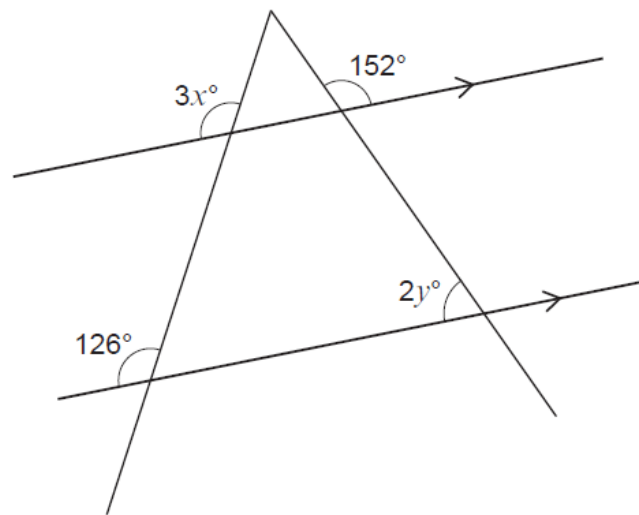


Diagram not
drawn to scale

Find the value of x and the value of y .

[3]

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$x =$ $y =$

Question taken from Eduqas examination paper 530002, November 2022

#2

In the diagram, triangle ABC is isosceles.

AC and DE are parallel, $\hat{BAC} = 72^\circ$ and $\hat{ACD} = 37^\circ$.

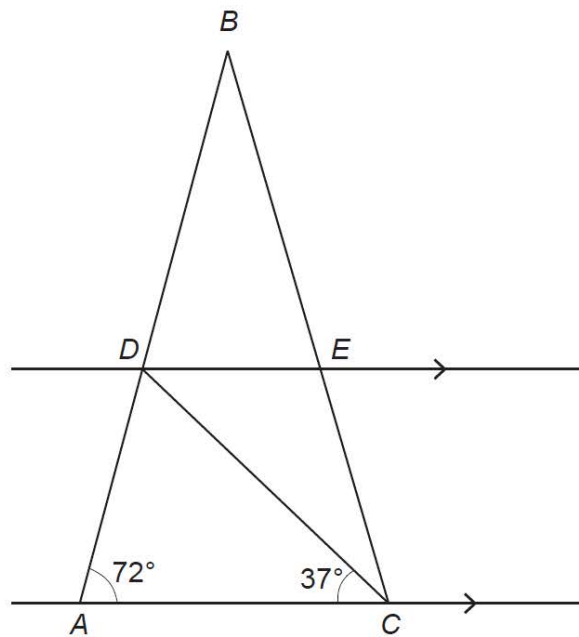


Diagram not drawn to scale

(a) Find the size of each of the following angles.

(i) $\hat{BDE}$

[1]

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(ii) $\hat{CDE}$

[1]

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(iii) $\hat{ABC}$

[2]

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(b) Write the mathematical name of quadrilateral $ACED$.

[1]

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Question taken from Eduqas examination paper 530002, November 2019

Interior / Exterior Angles of Polygons: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

#1

Calculate the size of an interior angle of a regular 10-sided shape (decagon).

[3]

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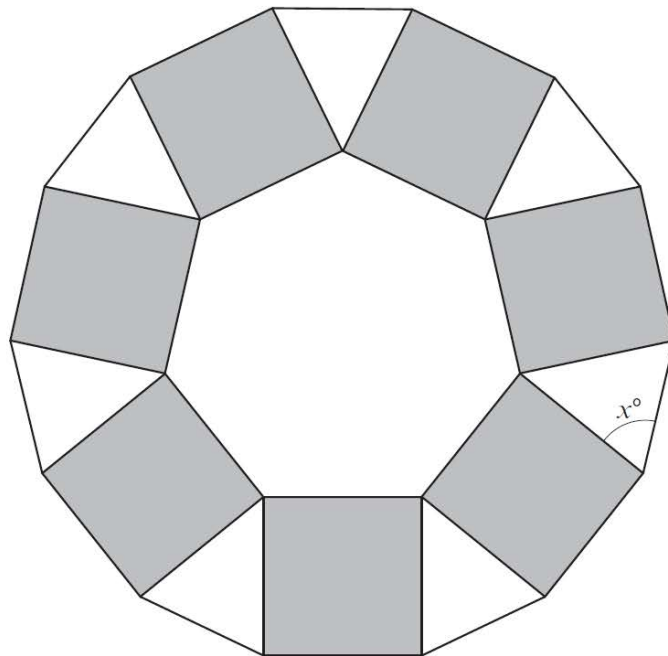
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Question taken from Eduqas examination paper 530001, November 2022

Interior / Exterior Angles of Polygons: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
Total	4	

#1



This pattern is made from a regular seven-sided polygon surrounded by squares and isosceles triangles.

Show that the value of x is 64.3 correct to 1 decimal place.

[4]

You must show all your working.

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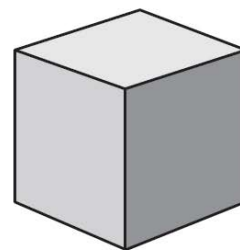
Question taken from Eduqas examination paper 530002, November 2020

Perimeter / Area / Volume: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	3	
#4	4	
#5	5	
#6	5	
Total	20	

#1

A solid cube of metal is at rest on horizontal ground.
The cube has sides of length 10 cm.



(a) Find the area of one of the faces of the cube.

[1]

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Area cm²

Question taken from Eduqas examination paper 530001, November 2018

#2

Robin makes the two cubes below from centimetre cubes.

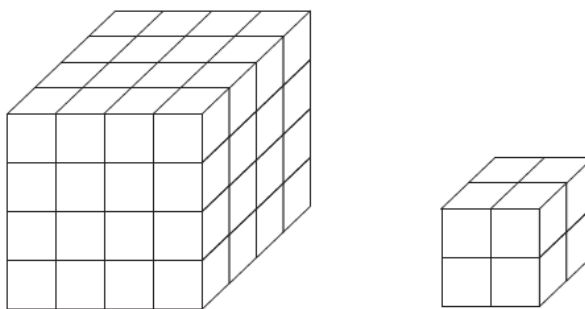


Diagram not drawn to scale

Sarah uses **all** of Robin's centimetre cubes to make a **single** cuboid.

Each of the dimensions of Sarah's cuboid will be greater than one centimetre.

Give the dimensions of a cuboid that Sarah could make.

[2]

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Question taken from Eduqas examination paper 530001, May 2024

#3

The diagram shows a triangle, PQR , with height PS .

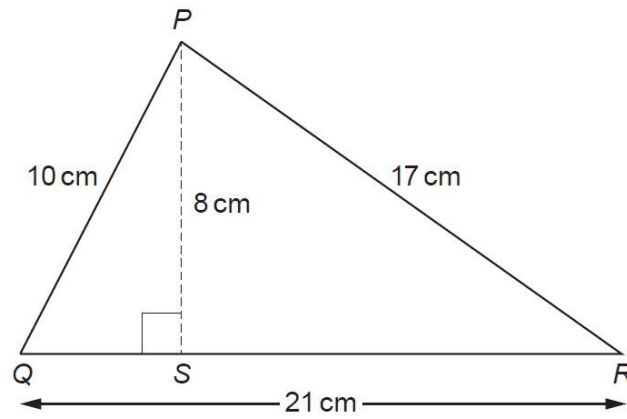


Diagram not drawn to scale

- (a) Work out the area of triangle PQR .

[2]

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- (b) PS is the shortest possible distance from P to QR .
Explain why this is correct.

[1]

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Question taken from Eduqas examination paper 5300001, June 2018

#4

- (a) On the 1 cm square grid below, draw a rectangle that has an area of 16 cm^2 and a perimeter of 20 cm.

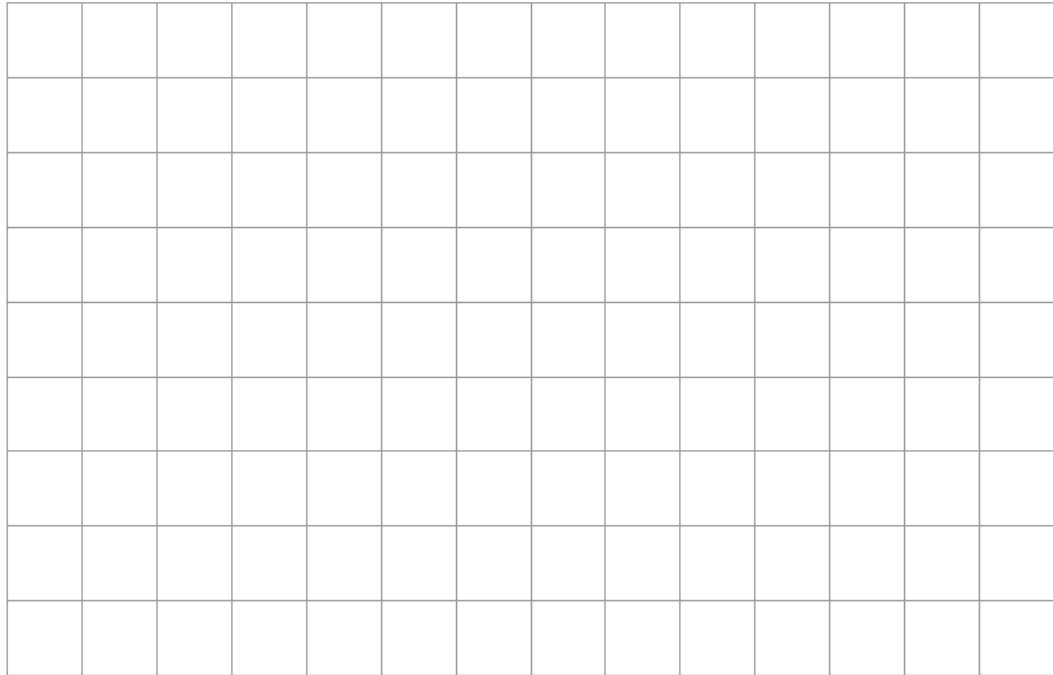
[2]

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- (b) The radius of a circle is 8 cm.

- (i) Write down the diameter of this circle.

[1]

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..... cm

- (ii) Write the ratio of the length of the radius to the length of the diameter.
Give the ratio in its simplest form.

[1]

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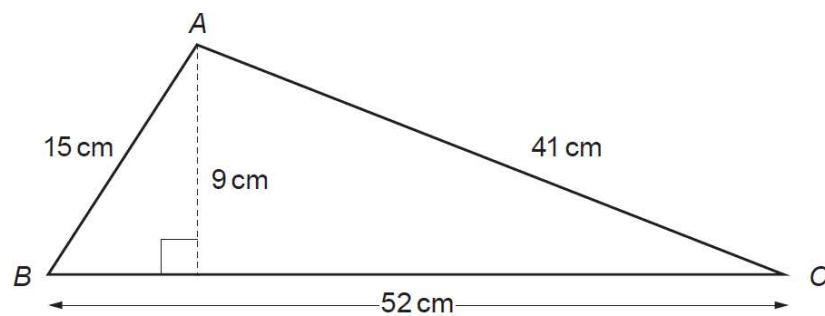
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radius : diameter = :

Question taken from Eduqas examination paper 530001, May 2023

#5

(a)

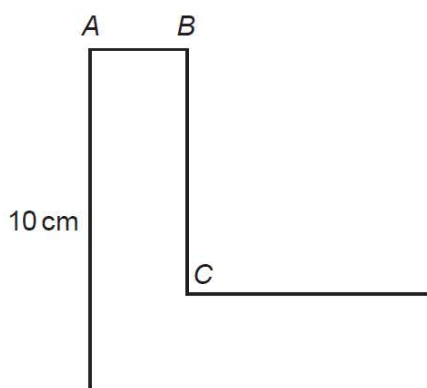
*Diagram not drawn to scale*

Work out the area of triangle ABC.

[2]

Area ABC = cm²

(b) This shape is made from two rectangles.

*Diagram not drawn to scale*

The shape has one line of symmetry.
 The perimeter of the shape is 40 cm.
 The length of BC is 4 times the length of AB.

Work out the length of BC.

[3]

BC = cm

Question taken from Eduqas examination paper 530001, June 2019

#6

Sarah has a water container in the shape of a cuboid.
The area of the base of the container is 150 cm^2 .

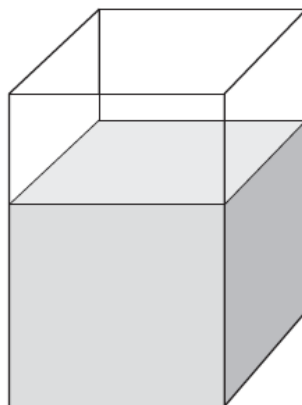


Diagram not drawn to scale

Water is leaking from the container at a constant rate.

At 10:00 the water is 20 cm high.

At 10:15 the water is 17 cm high.

How much water is in the container at 11:00?

Give your answer in litres.

[5]

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There are litres of water in the container at 11:00.

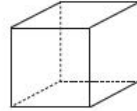
Question taken from Eduqas examination paper 530001, November 2023

Perimeter / Area / Volume: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	2	
#4	2	
#5	3	
#6	3	
#7	3	
#8	3	
#9	4	
#10	4	
#11	4	
#12	5	
#13	6	
#14	6	
#15	6	
#16	6	
Total	60	

#1

- (b) The total surface area of a different cube is 144 cm^2 .



To work out the side length of this cube, Mai does the following calculations:

$$\sqrt{144} = 12$$
$$12 \div 6 = 2$$

Mai's method is incorrect.

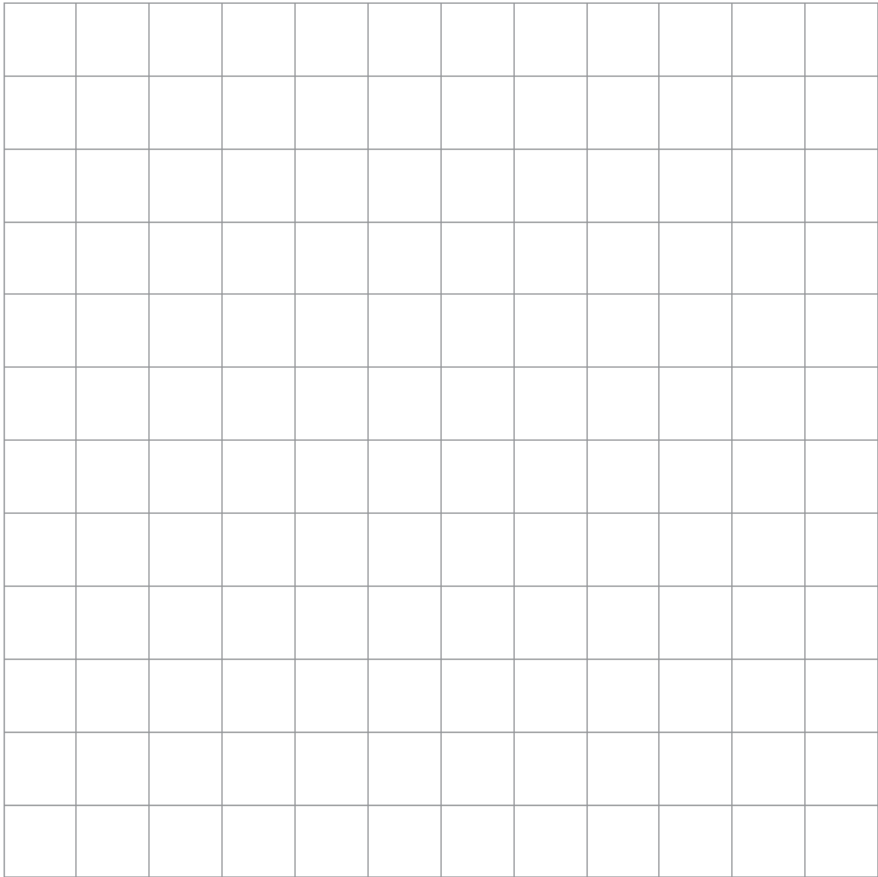
Explain the mistake that Mai has made.

[1]

Question taken from Eduqas examination paper 530002, November 2020

#2

- (a) On the 1 cm² grid below, draw a rectangle with an area of 27 cm². [1]



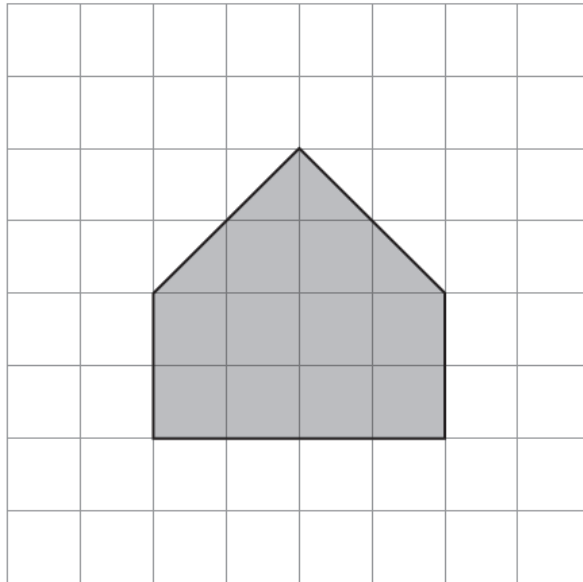
- (b) Calculate the perimeter of the rectangle drawn in part (a). [1]

Perimeter = cm

Question taken from Eduqas examination paper 530002, November 2024

#3

A shape is drawn on the 1 cm square grid below.



- (a) What is the area of the shape?

[1]

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The area of the shape is cm^2

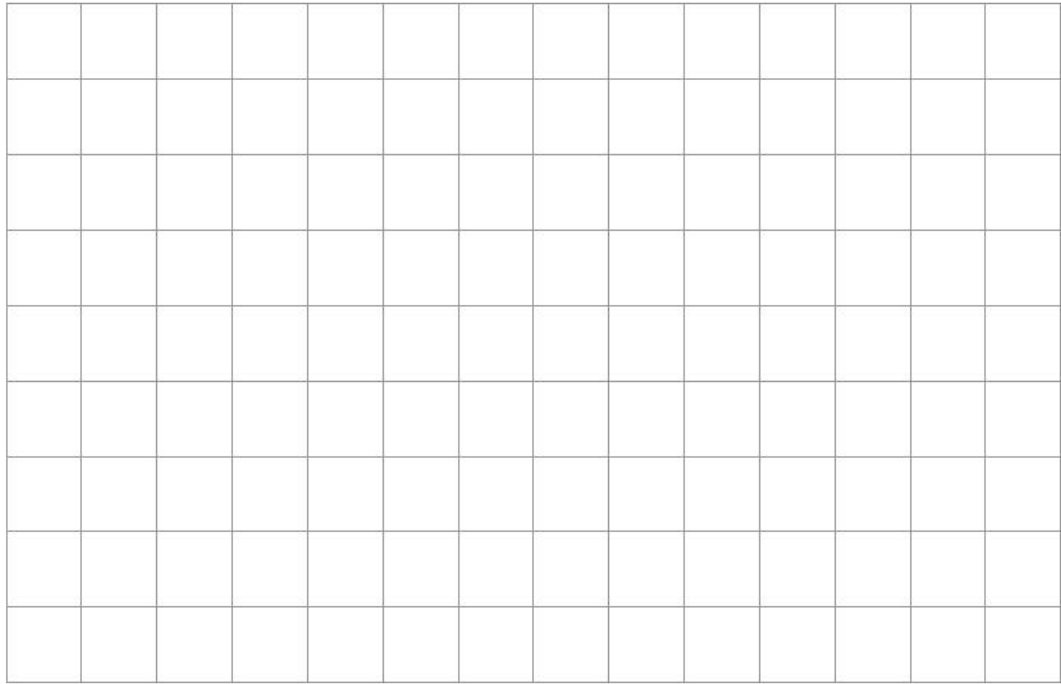
- (b) On the 1 cm square grid below, draw a **rectangle** with the same area as the shape on page 4.

[1]



#4

- (a) (i) On the 1 cm square grid below, draw a rectangle that has an area of 24 cm^2 . [1]



- (ii) Write down the perimeter of the rectangle you have drawn in part (i). [1]

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..... cm

Question taken from Eduqas examination paper 530002, November 2021

#5

- (b) The diagram shows a parallelogram.
It is the cross-section of a prism.

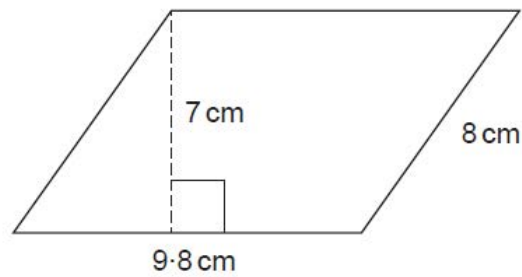


Diagram not drawn to scale

The length of the prism is 16 cm.
Find the volume of the prism.

[3]

Question taken from Eduqas examination paper 530002, June 2023

#6

The rectangle below has a length of 12 cm and an area of 54 cm^2 .

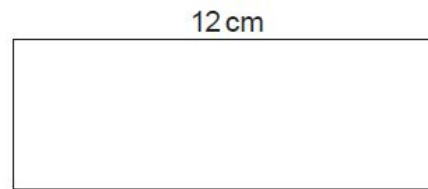


Diagram not drawn to scale

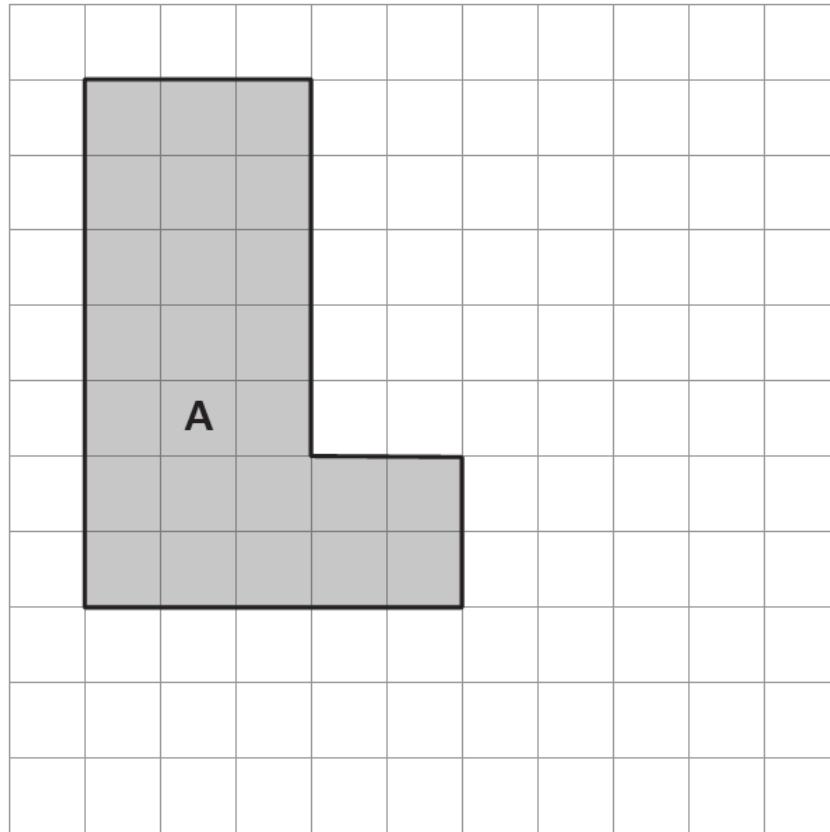
The rectangle is enlarged by a scale factor of 3.

Calculate the width of the enlarged rectangle.

[3]

Question taken from Eduqas examination paper 530002, June 2019

#7

Shape A is shown on the 1 cm grid.

- (a) On the grid below, draw a **square** that has the same area as **shape A**.

[1]



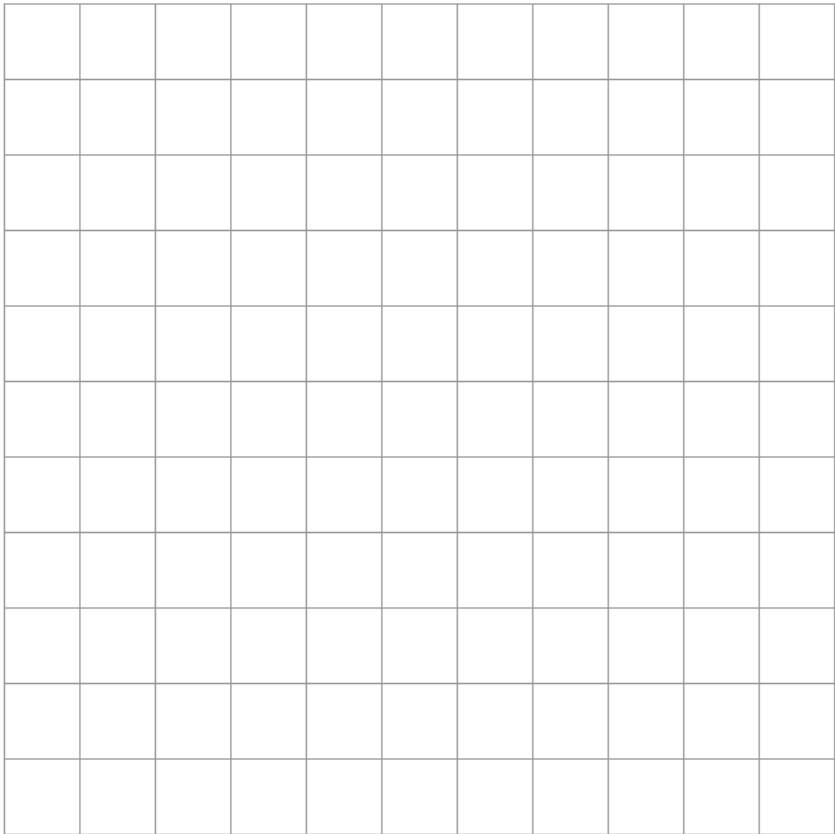
(b) (i) Work out the perimeter of **shape A**. [1]

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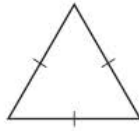
(ii) On the grid below, draw a **rectangle** that has the same perimeter as **shape A**. [1]



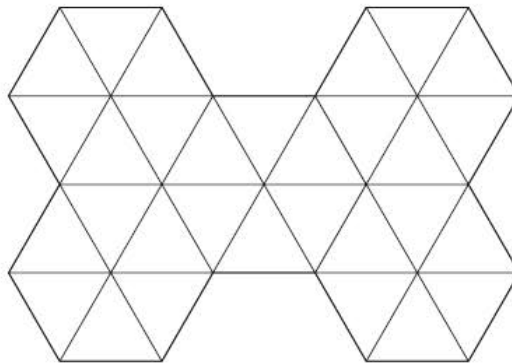
Question taken from Eduqas examination paper 530002, November 2023

#8

The diagram below shows a triangular tile.



(b) Some of these triangular tiles are arranged into a pattern.



Each triangle has sides of length 6 cm.
Calculate the perimeter of the pattern.

[2]

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(c) What fraction of the pattern is one triangular tile?

[1]

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Question taken from Eduqas examination paper 530002, June 2018

#9

A rectangle has a perimeter of 18 cm.

The length and the width are both whole numbers.
The length is always greater than the width.

- (a) Complete the table to show all the possible lengths and widths of the rectangle. [2]

Rectangle	Length (cm)	Width (cm)
A	8	1
B		
C		
D		

- (b) Which rectangle from your table has the greatest area?

Show how you decide. [2]

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Question taken from Eduqas examination paper 530002, June 2018

#10

- (a) The diagram shows a rectangular wall.

Calculate the area of the wall.

Round your answer correct to the nearest 10 m^2 .

[3]

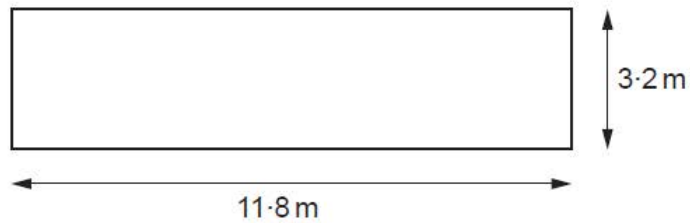


Diagram not drawn to scale

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- (b) The area of a different wall is 110 m^2 .
Liesel wants to paint the wall. She uses paint from tins that each cover 25 m^2 .

She calculates $110 \div 25 = 4.4$ and says,

"I need to buy 4 tins of paint."

Is Liesel correct?

Yes

☐

No

☐

Explain how you decide.

[1]

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Question taken from Eduqas examination paper 530002, November 2019

#11

The diagram shows a vegetable plot in the shape of a trapezium.

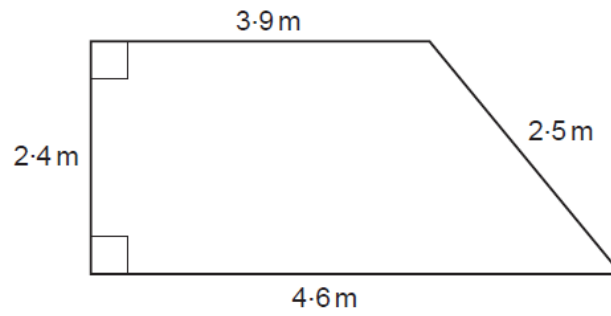


Diagram not drawn to scale

It costs £1.35 per m^2 to treat the plot with fertiliser.

Show that it costs less than £14 to treat the plot with fertiliser.

[4]

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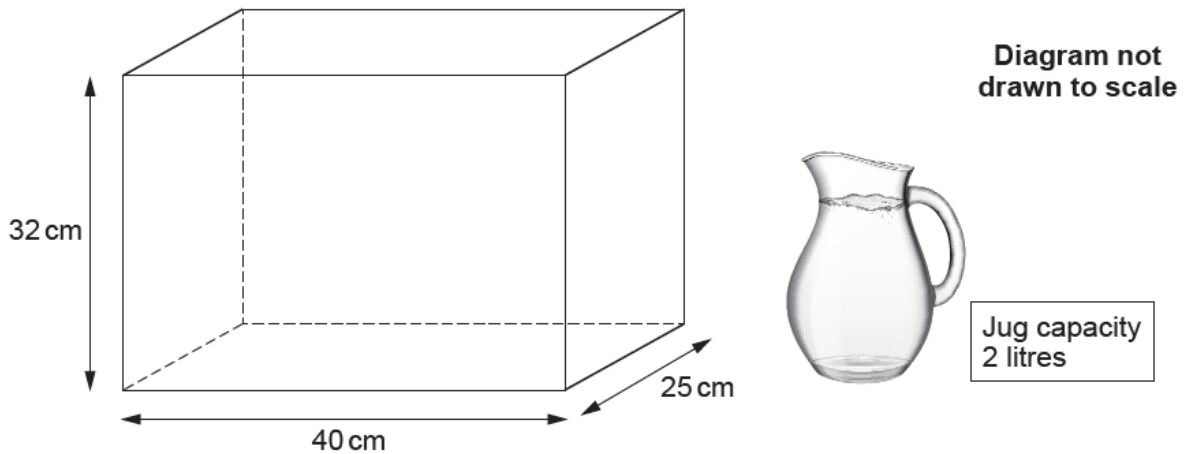
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Question taken from Eduqas examination paper 530002, November 2021

#12

Tobias has a tank in the shape of a cuboid.
It has length 40 cm, width 25 cm and depth 32 cm.
He uses a jug with a capacity of 2 litres to fill the tank.
The tank and jug are shown below.



Tobias fills the jug to the top with water and pours it into the tank.
He repeats the process until the tank is full.

How many times does Tobias fill the jug?

[5]

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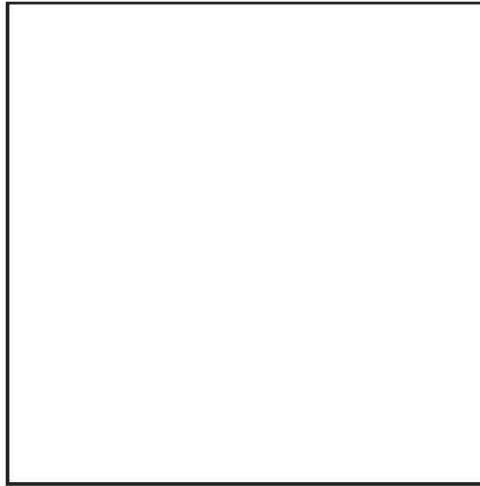
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Tobias fills the jug times.

Question taken from Eduqas examination paper 530002, November 2022

#13

(a) This square has been drawn accurately.



A rectangle has exactly the same area as the square.
The width of the rectangle is 5 cm.

Calculate the length of the rectangle.
You must show all your working.

[6]

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Question taken from Eduqas examination paper 530002, November 2018

#14

(a) Verity is arranging these 6 identical tiles into different shapes.

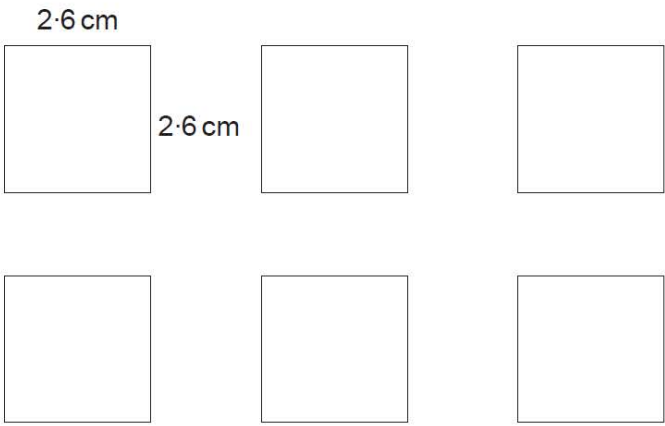
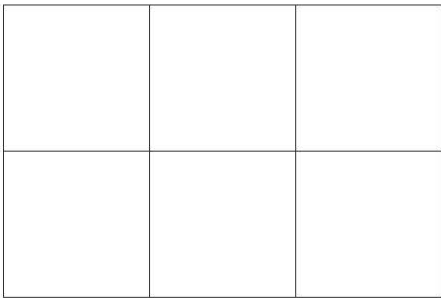


Diagram not drawn to scale

Each tile is a square with sides of length 2.6 cm.

Verity makes these two shapes by placing tiles side by side:

Shape 1



Shape 2

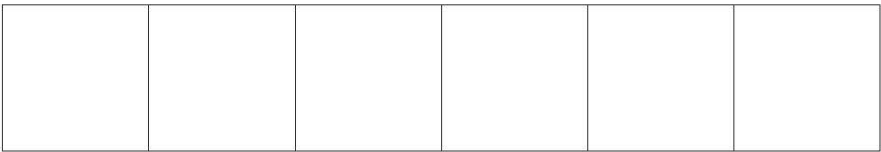


Diagram not drawn to scale

Calculate the perimeter of each shape. [3]

Perimeter of shape 1

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Perimeter of shape 2

.....

- (b) Maddie has 9 of the same square tiles.
Maddie arranges her 9 tiles to make a shape that has the smallest possible **perimeter**.

(i) Sketch Maddie's shape. [1]

(ii) Calculate the **area** of Maddie's shape. [2]

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Area = cm²

Question taken from Eduqas examination paper 530002, June 2019

#15

- (a) A Headteacher wants to put new carpet in one of his classrooms. He uses carpet that costs £12.48 per m^2 .

The diagram below shows the dimensions of the classroom.

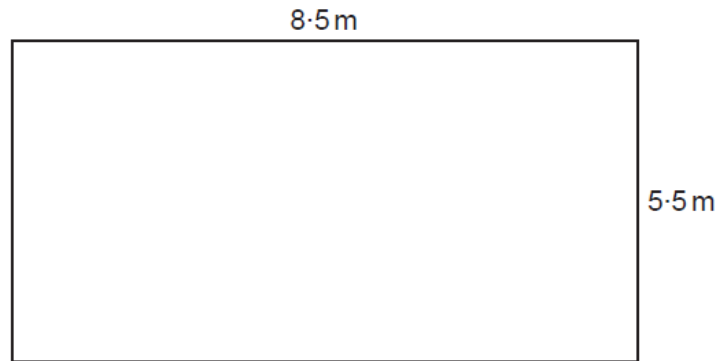


Diagram not drawn to scale

How much will it cost to buy the exact amount of carpet needed to cover the classroom floor? [3]

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- (b) The Headteacher needs to buy vinyl flooring for a different classroom with an area of 67.2m^2 . It is sold in rolls that each cover an area of 10.5m^2 .

What is the minimum number of rolls of vinyl flooring he needs to buy? [3]

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Question taken from Eduqas examination paper 530002, June 2022

#16

Austin owns a cake shop.

- (a) He sells his cakes in boxes.

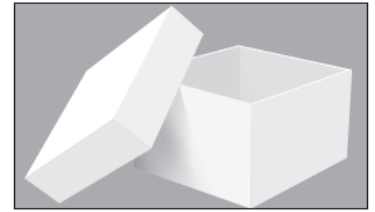
Austin buys some boxes.

Each box costs £1.35.

He pays a total of £63.75 which includes a £3 delivery charge.

How many boxes did Austin buy?

[2]

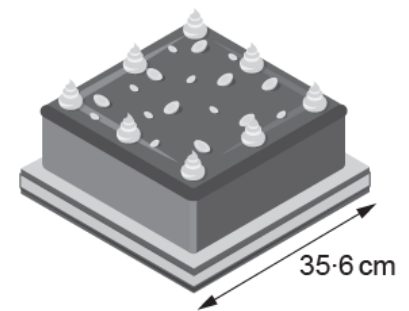


- (b) Austin uses cake boards to display his cakes.
Each board is square with sides of length 35.6 cm.
He puts ribbon around the perimeter of the boards for decoration.

Austin has 4 metres of ribbon.

He puts the ribbon around the perimeter of **two** cake boards.

The ribbon does not overlap on either board.



How much ribbon will Austin have left over?

[4]

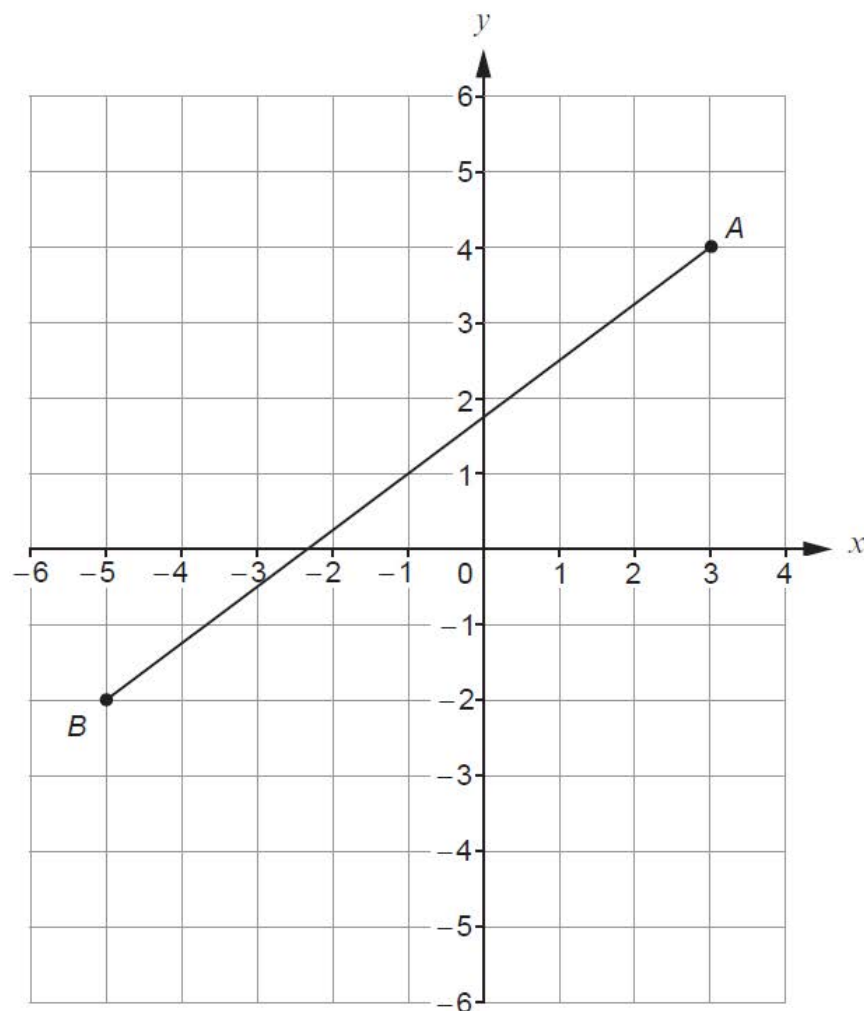
Austin will have of ribbon left over.

Question taken from Eduqas examination paper 530002, June 2024

Geometrical Problems on Coordinate Axes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
Total	8	

#1



The line AB is drawn on the 1 cm grid above.

- (a) (i) Write down the coordinates of A .

[1]

A (..... ,)

- (ii) The point C is the mid-point of AB .

Mark the position of the point C on the grid.

[1]

- (b) The line BD is parallel to the y -axis.
Triangle ABD is a right-angled triangle.

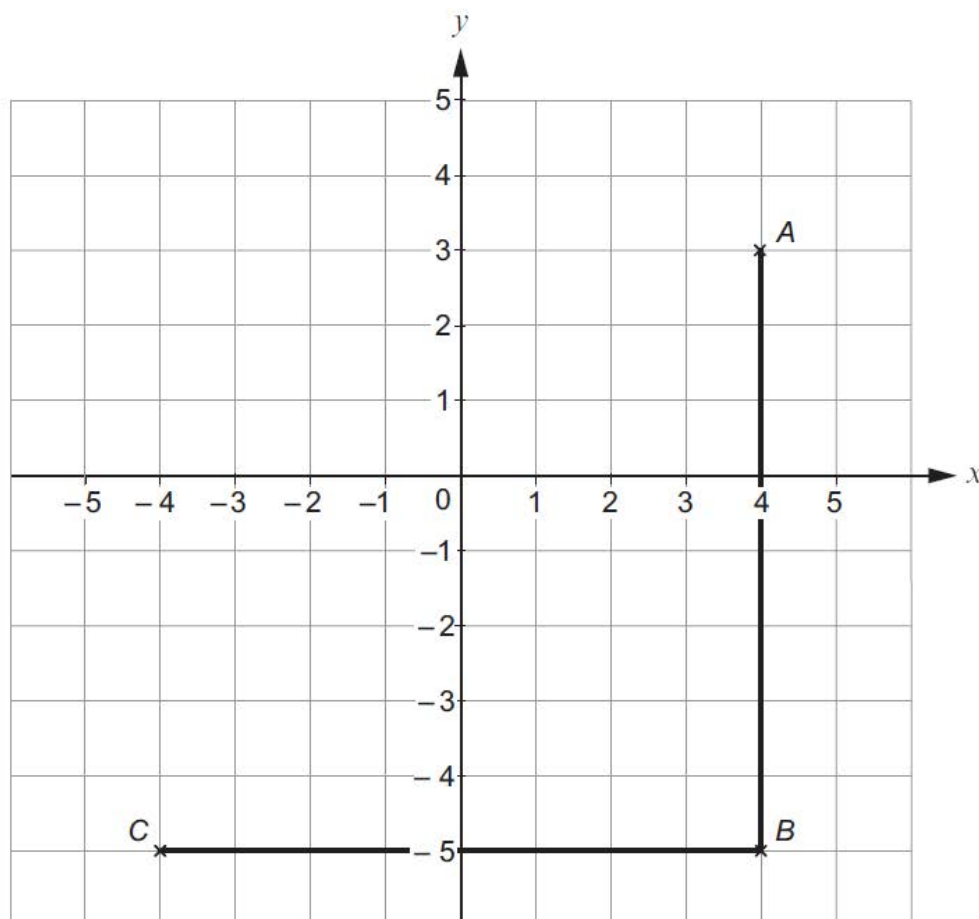
Mark the position of point D on the grid and write down the length of AD .

[2]

Length AD = cm

Question taken from Eduqas examination paper 530001, June 2019

#2



Part of a square, $ABCD$, is drawn accurately on the 1 cm grid above.

(a) On the diagram, mark the position of D .

[1]

(b) Write down the coordinates of D .

D (..... ,) [1]

(c) Work out the perimeter of the square $ABCD$.
You must state the units of your answer.

[2]

.....

.....

Perimeter = units

Question taken from Eduqas examination paper 530001, November 2018

Geometrical Problems on Coordinate Axes: Calculator

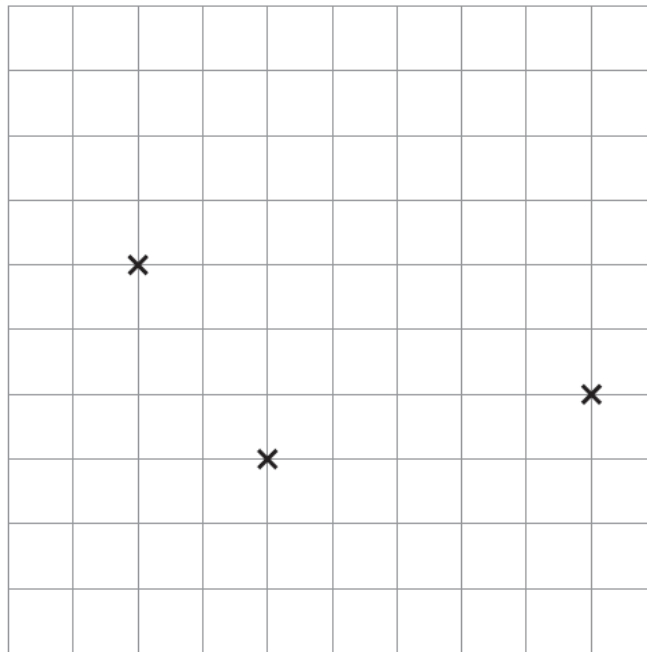
Question	Maximum Mark	Mark Awarded
#1	1	
#2	4	
#3	4	
Total	9	

#1

(b) Three vertices of a parallelogram have been plotted on the grid below.

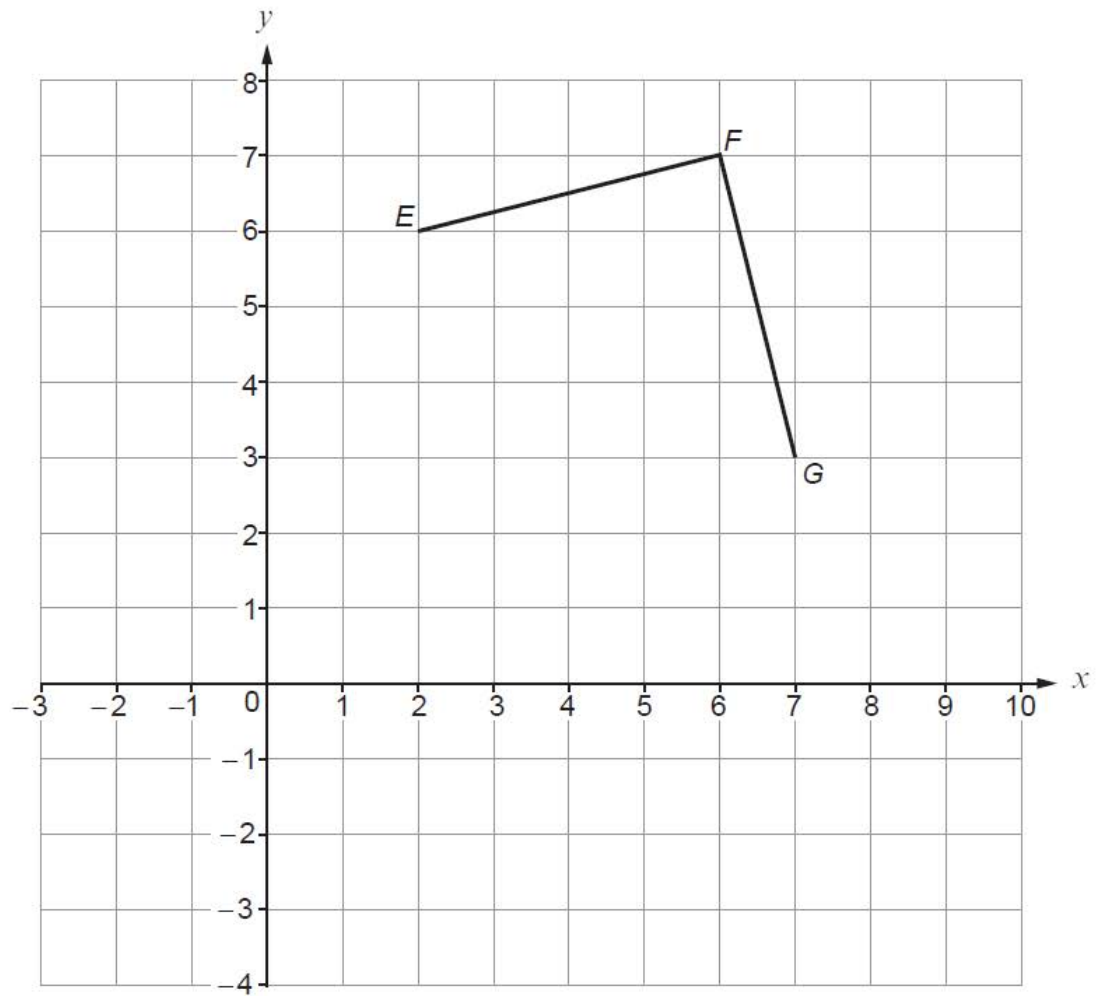
Plot the fourth vertex of the parallelogram.

[1]



Question taken from Eduqas examination paper 530002, June 2022

#2

Two sides of a square $EFGH$ are shown on the 1 cm grid below.

- (a) Point H of the square is missing from the diagram.
Mark point H on the diagram.
Write down the coordinates of point H .

[2]

(..... ,)

- (b) Point J is the reflection in the y -axis of point E .
Mark point J on the diagram.
Write down the coordinates of point J .

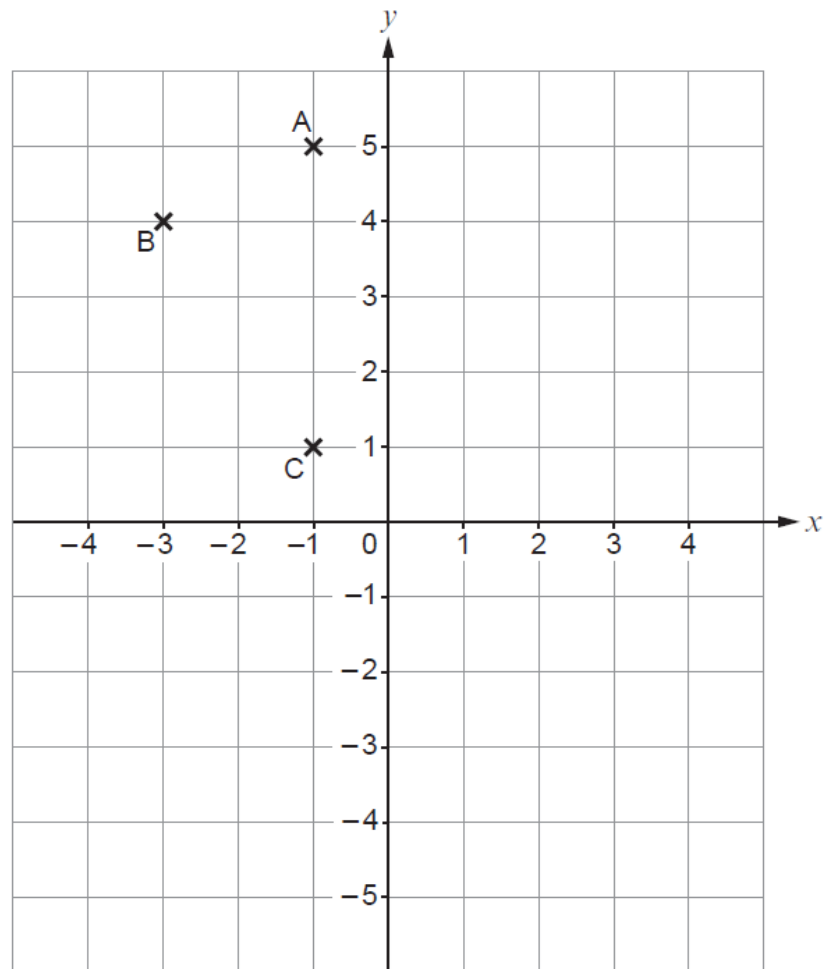
[2]

(..... ,)

Question taken from Edugas examination paper 530002, November 2019

#3

ABCD is a kite.
Three of its vertices have been plotted on the grid below.



(a) Plot point D on the grid to complete the kite. [1]

(b) Write down the coordinates of point D. [1]

D = (..... ,)

(c) Draw a reflection of the kite ABCD in the x axis. [2]

Question taken from Eduqas examination paper 530002, November 2023

Constructions Using Ruler / Compass / Protractor: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	5	
Total	9	

#1

(b) ABC is a right-angled triangle in which:

- $AB = 8\text{ cm}$,
- angle $A = 90^\circ$,
- $AC = 6.5\text{ cm}$.

Complete an accurate drawing of triangle ABC .
 AB has been drawn for you.

[2]



Question taken from Eduqas examination paper 530002, November 2019

#2

(b) The diagram shows a sketch of triangle ABC .

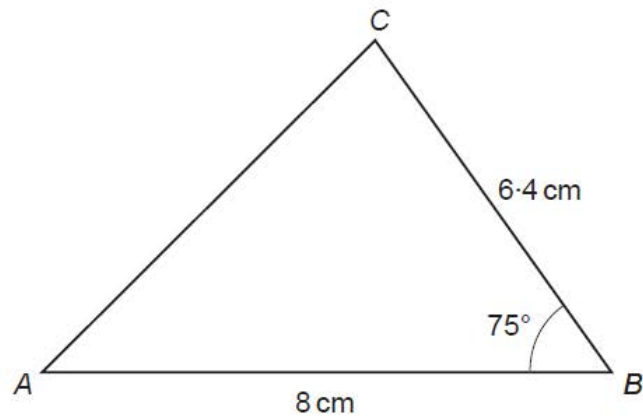


Diagram not drawn to scale

Use a ruler and protractor to complete an accurate drawing of triangle ABC .
 AB has been drawn for you.

[2]



Question taken from Eduqas examination paper 530002, November 2021

#3

Cheng stands at O and rolls a ball along the horizontal ground.

The ball stops at point B , which:

- is equidistant from X and Y ,
- lies on the bisector of angle XOY .

Use a ruler and a pair of compasses to **construct** suitable lines and arcs to show the position of point B .

Construction arcs must be clearly shown.

[5]

X •

• Y

O •

Question taken from Eduqas examination paper 530002, November 2020

Plans & Elevations: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	3	
#3	3	
Total	7	

#1

- (b) The diagram shows the plan and side elevation of another 3D shape.



Circle a correct name for the 3D shape shown.

[1]

cylinder

triangular
prism

pyramid

cone

sphere

Question taken from Eduqas examination paper 530001, June 2018

#2

- (a) Halima makes a shape by joining 5 cubes.

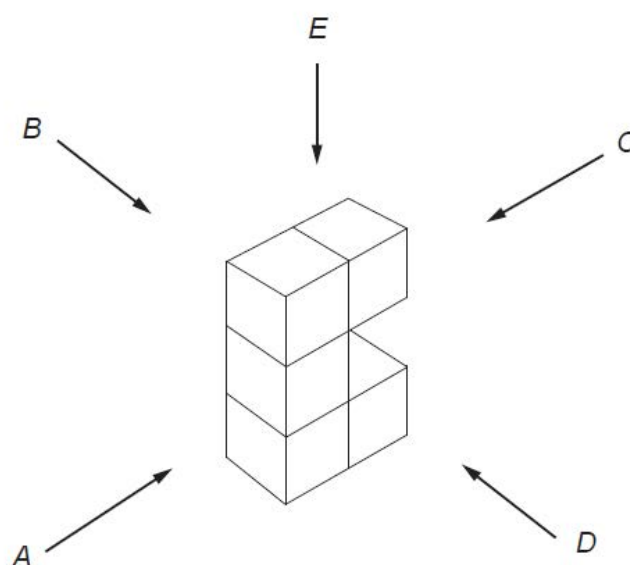
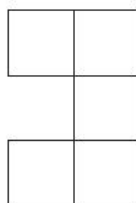


Diagram not drawn to scale

She looks at each of the side elevations, from the positions A, B, C and D, and the plan, from E.

- (i) Here is what Halima sees from one of her positions.



Which position is this?
Circle your answer.

[1]

*A**B**C**D**E*

- (ii) How many square faces can Halima see from position *C*?
Circle your answer.

[1]

1

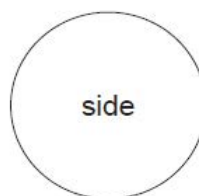
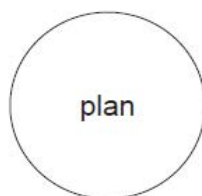
2

3

4

5

- (b) The diagram shows the plan and side elevation of another 3D shape.



Circle the correct name for the 3D shape shown.

[1]

cylinder

circle

pyramid

cone

sphere

Question taken from Eduqas examination paper 530001, June 2019

The diagram shows a cylinder.

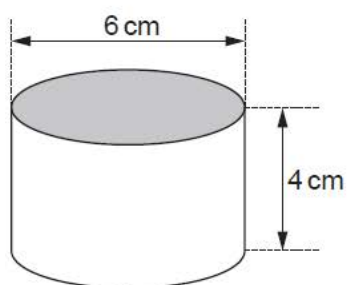


Diagram not drawn to scale

- the plan of the cylinder,
- the side elevation of the cylinder.

[3]

The image shows a large grid of dots on a white background, intended for architectural drawing. The grid is divided into two main sections by a horizontal line. The top section is labeled 'Plan' in a small box at the top left. The bottom section is labeled 'Side elevation' in a small box on the left. The grid consists of 16 columns and 16 rows of dots. The 'Plan' section occupies the top 10 rows, and the 'Side elevation' section occupies the bottom 6 rows. The dots are arranged in a regular, spaced-out pattern, providing a guide for drawing the footprint of a building in the plan view and its profile in the side elevation view.

Question taken from Eduqas examination paper 530001, November 2019

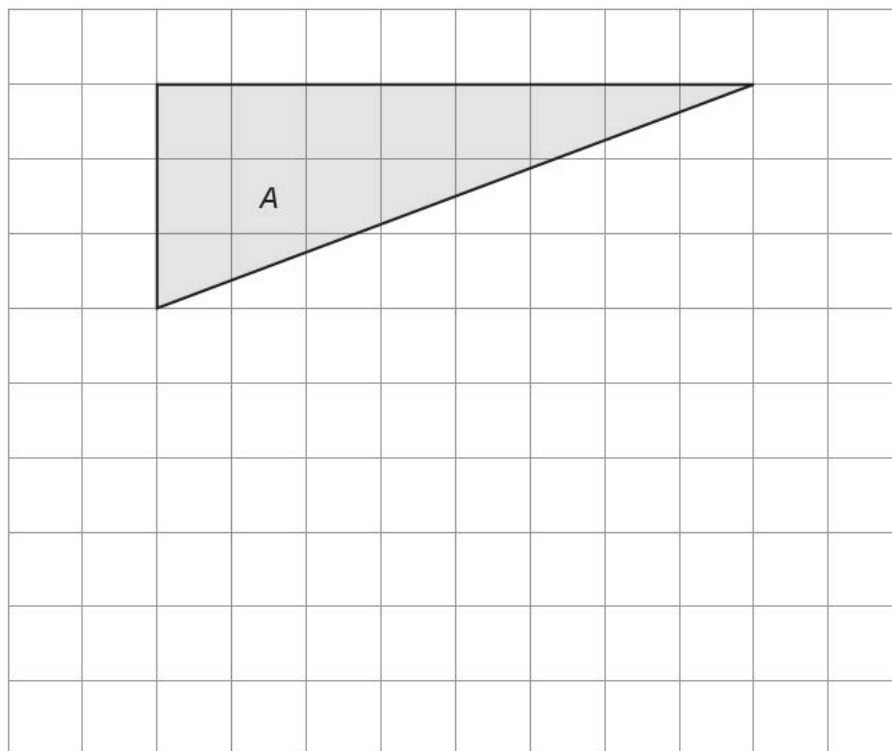
Similarity & Congruency: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	4	
#4	6	
Total	13	

#1

(b) On the grid below, draw a triangle that is congruent to triangle A.

[1]



Question taken from Eduqas examination paper 5300001, November 2019

#2

Two squares are always similar.

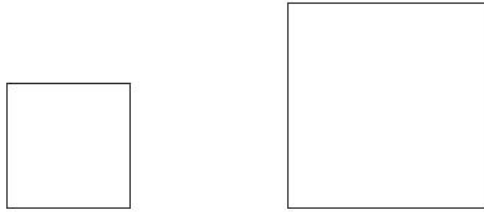


Diagram not drawn to scale

The **areas** of two squares are in the ratio 4 : 9.

- (a) Complete this statement with a fraction. [1]

The area of the smaller square is of the area of the larger square.

- (b) Write down a possible length for
- the side of the smaller square,
 - the side of the larger square.
- Give your answer as a ratio. [1]

.....

side of smaller square : side of larger square is :

Question taken from Eduqas examination paper 5300001, June 2018

#3

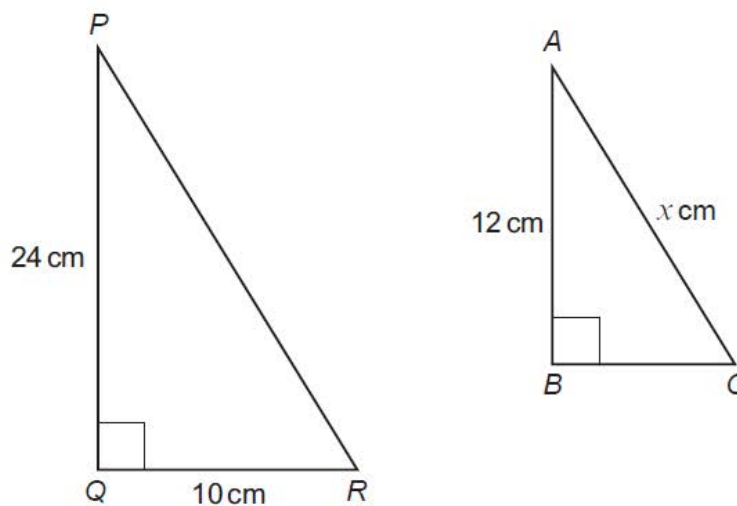


Diagram not drawn to scale

The diagram shows two similar, right-angled triangles, PQR and ABC .

Find the value of x .

[4]

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$x =$

Question taken from Edugas examination paper 530001, November 2018

#4

(a) Four triangles are shown in the diagram below.

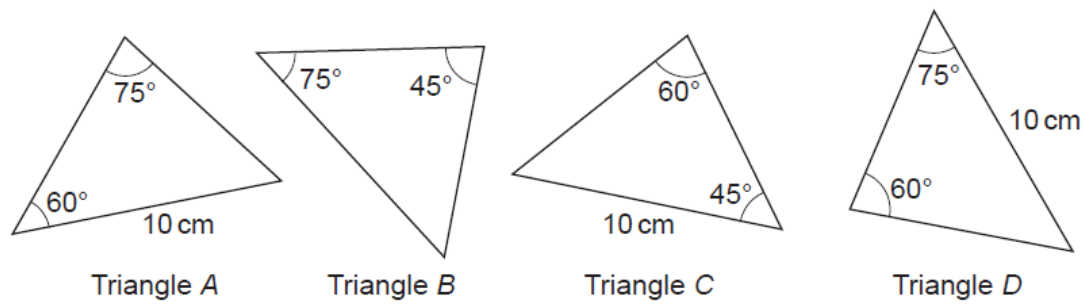


Diagram not drawn to scale

For each of the following statements choose 'True', 'False' or 'Need more information'.
Tick **one** box for each statement. [2]

Statement	True	False	Need more information
Triangle A is congruent to Triangle B			
Triangle C is congruent to Triangle D			
Triangle A is congruent to Triangle C			

(b) Is it possible to draw an isosceles triangle with an exterior angle of 60°?
Tick the appropriate box and show working to explain your reason. [2]

Yes ☐

No ☐

Reason:

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(c) Two triangles are shown in the diagram below.

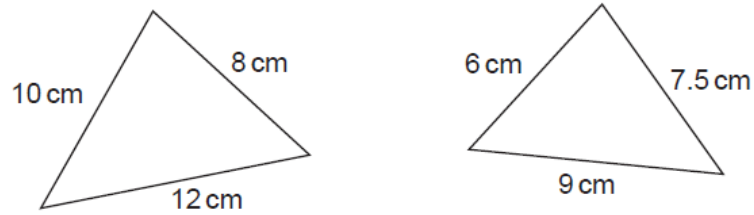


Diagram not drawn to scale

Show that the two triangles are mathematically similar.

[2]

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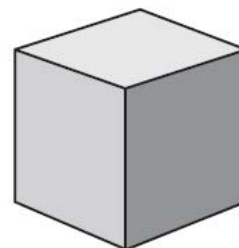
Question taken from Eduqas examination paper 530001, November 2024

Converting Units: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
Total	1	

#1

A solid cube of metal is at rest on horizontal ground.
The cube has sides of length 10 cm.



(b) The cube has a mass of 0.8 kg.

A mass of 1 kg has a weight of approximately 10 newtons.

Calculate the approximate weight of the cube.

[1]

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Approximate weight N

Question taken from Eduqas examination paper 530001, November 2018

Converting Units: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	1	
#3	3	
#4	4	
#5	6	
Total	15	

#1

Wayne says, '6.5 m² is the same as 650 cm², because there are 100 cm in 1 metre.'

Maria says, '6.5 m² is the same as 65 000 cm².'

Explain why Maria is correct.

[1]

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Question taken from Eduqas examination paper 530002, June 2018

#2

(a) Circle the correct conversion of 7 m³ to cm³.

[1]

0.00007

0.07

700

70 000

7 000 000

.....

.....

Question taken from Eduqas examination paper 530002, November 2022

#3

(a) A pie filling is made using 3.5 kg of apples and 475 g of blackberries.

(i) Change 3.5 kg into grams.

[1]

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(ii) Write the quantity of apples to the quantity of blackberries as a ratio, in its simplest form.

[2]

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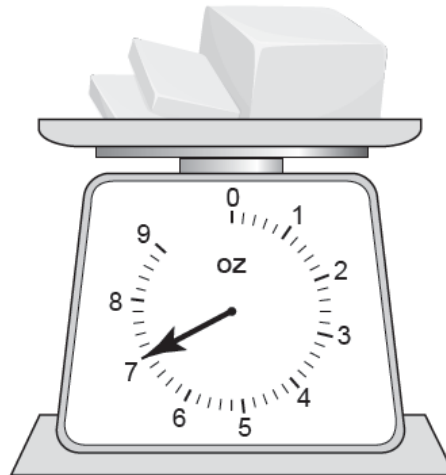
Question taken from Eduqas examination paper 530002, November 2018

#4

- (c) Use the information below to convert between ounces and grams.

$$1 \text{ ounce (oz)} = 28.35 \text{ grams (g)}$$

- (i) The scales below show how many **ounces** of butter Austin uses to make 1 cake.



How many **grams** of butter does Austin need to make 3 cakes?

[2]

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- (ii) Austin buys bags of sugar.
Each bag has a mass of 500 g.

What is the mass of one bag of sugar in **ounces**?
Give your answer to the nearest ounce.

[2]

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Question taken from Eduqas examination paper 530002, June 2024

#5

Use: 1 mile = 1.6 km



- (a) The Earth travels around the Sun at 30 km per second.

Convert 30 km per second into miles per second.

[2]

- (b) (i) The diagram shows a field. It has an area of 1 square mile.

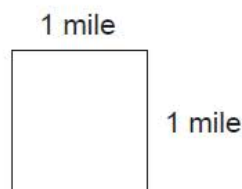


Diagram not drawn to scale

What is the area of the field in square kilometres?

[2]

- (ii) The surface area of the Earth is about two hundred million square miles.

Calculate the surface area of the Earth in square kilometres.

[2]

Question taken from Eduqas examination paper 530002, November 2020

Bearings / Scale Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	5	
#5	8	
#6	9	
Total	33	

#1

The points Y and Z are shown on the scale drawing below.

Point X is 200 m from point Y on a bearing of 150° .
Plot point X on the scale drawing below.
Give the bearing of point X from point Z .

[3]

Scale:
1 cm represents 25 m



Bearing of X from Z = $^\circ$

Question taken from Eduqas examination paper 530001, November 2024

#2

The diagram shows the position of two points, *A* and *B*.
The scale is 1 cm represents 1 km.



1 cm represents 1 km

- (a) Measure and write down the bearing of *B* from *A*.

[1]

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- (b) Point *C* is 5 km from *A* and 6 km from *B*.
The bearing of *C* from *B* is an acute angle.

Complete the diagram to find the position of point *C*.

[3]

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Question taken from Eduqas examination paper 530001, June 2019

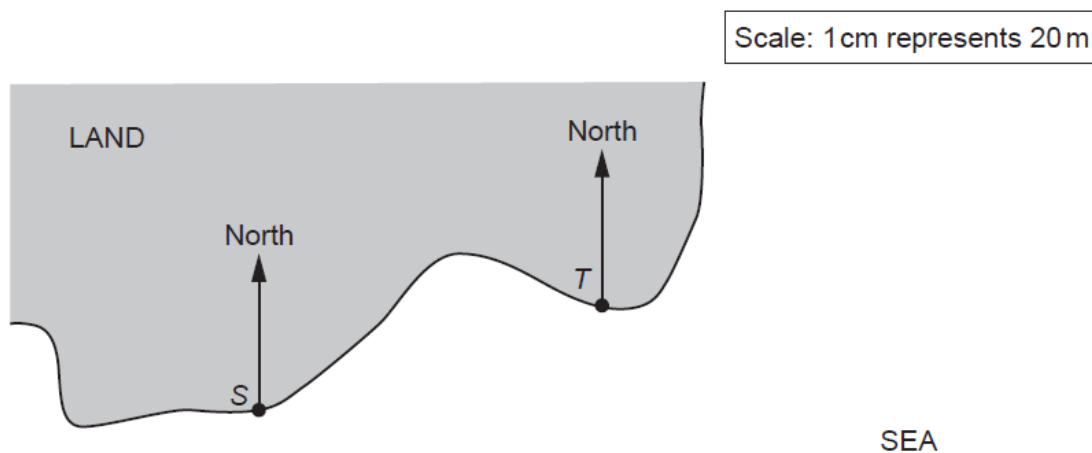
#3

Kit paddles a canoe out to sea from the point marked S .

He stops when he is:

- on a bearing of 160° from S
- 120m from S .

Use the scale diagram below to find Kit's distance and bearing from T when he stops. [4]



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Distance from T m Bearing from T $^\circ$

Question taken from Eduqas examination paper 530001, November 2022

#4

The diagram shows the position of two aeroplanes, P and Q .
There is a radar station at R .
The scale is 1 cm represents 0.5 km.

North



•

 P

North



•

 Q

North



•

 R

Scale: 1 cm represents 0.5 km

- (a) R is nearer to Q than it is to P .

How much nearer?

[2]

.....

.....

..... km

- (b) Measure and write down the bearing of R from P .

[1]

.....

- (c) There is an airport which is 2.5 km from R and to the south-west of Q .

Mark the position of the airport with a cross on the diagram.

[2]

Question taken from Eduqas examination paper 530001, November 2019

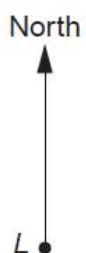
#5

- (a) The scale drawing shows the positions of a lighthouse (L), a port (P) and a harbour (H).

A boat (B) is at sea on a bearing of 135° from the lighthouse (L) and 064° from the port (P).

Mark the position of the boat on the drawing.

[3]



Scale: 1 cm represents 10 km

- (b) (i) In normal conditions, the boat uses 1 litre of fuel to travel 5 km.

Work out how many litres of fuel the boat will use to get to the harbour (*H*).
The scale is 1 cm represents 10 km.

[3]

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- (ii) State any assumption you have made in answering part (b)(i).
How would your answer to part (b)(i) change if you did not make this assumption?

[2]

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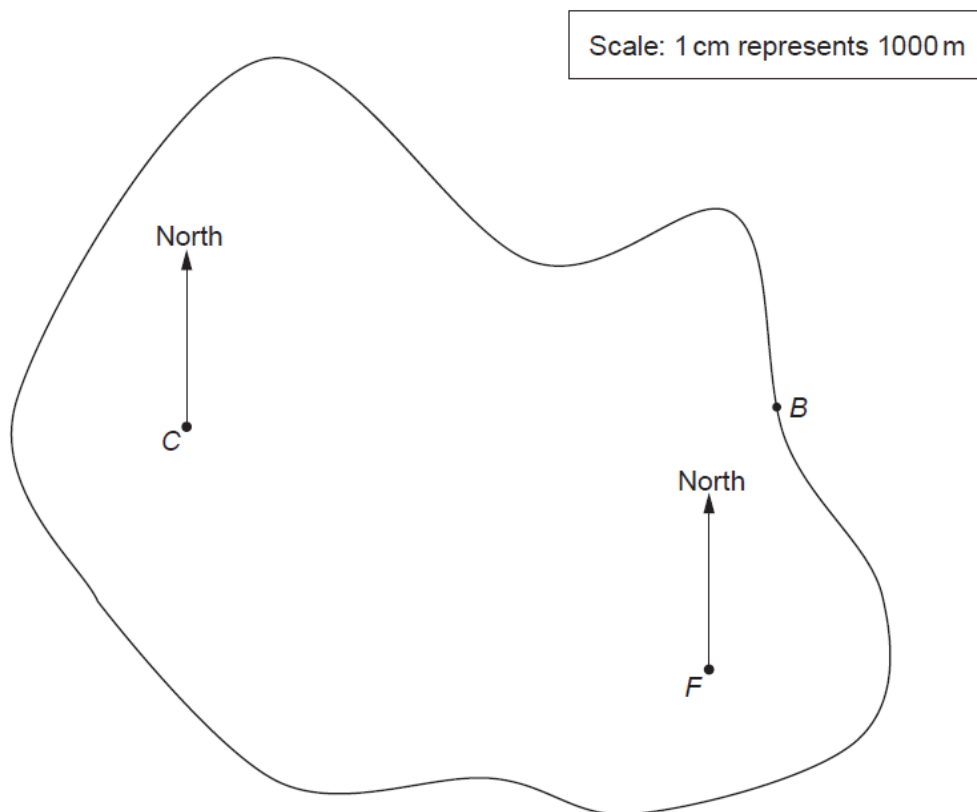
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Question taken from Eduqas examination paper 530001, June 2018

#6

- (a) The scale drawing shows the positions of a beach café (B), a church (C) and a farmhouse (F) on an island.



Don's house is on a bearing of 015° from the church (C) and on a bearing of 320° from the farmhouse (F).

- (i) Mark the position of Don's house (D) on the diagram. [3]
- (ii) Work out the shortest distance in metres from Don's house (D) to the beach café (B). [2]
- (b) During the holiday season, a boat brings people to a point on the island.
- Don drives a minibus taking people from the boat to the beach café.
- Don's minibus has seats for 16 passengers. He makes 3 trips every 2 hours from the boat to the beach café.
- He starts work at the boat at 10 a.m. and finishes at 5 p.m. His lunchtime lasts for 1 hour.



What is the greatest number of people Don can take from the boat to the beach café each day?
You must show all your working. [4]

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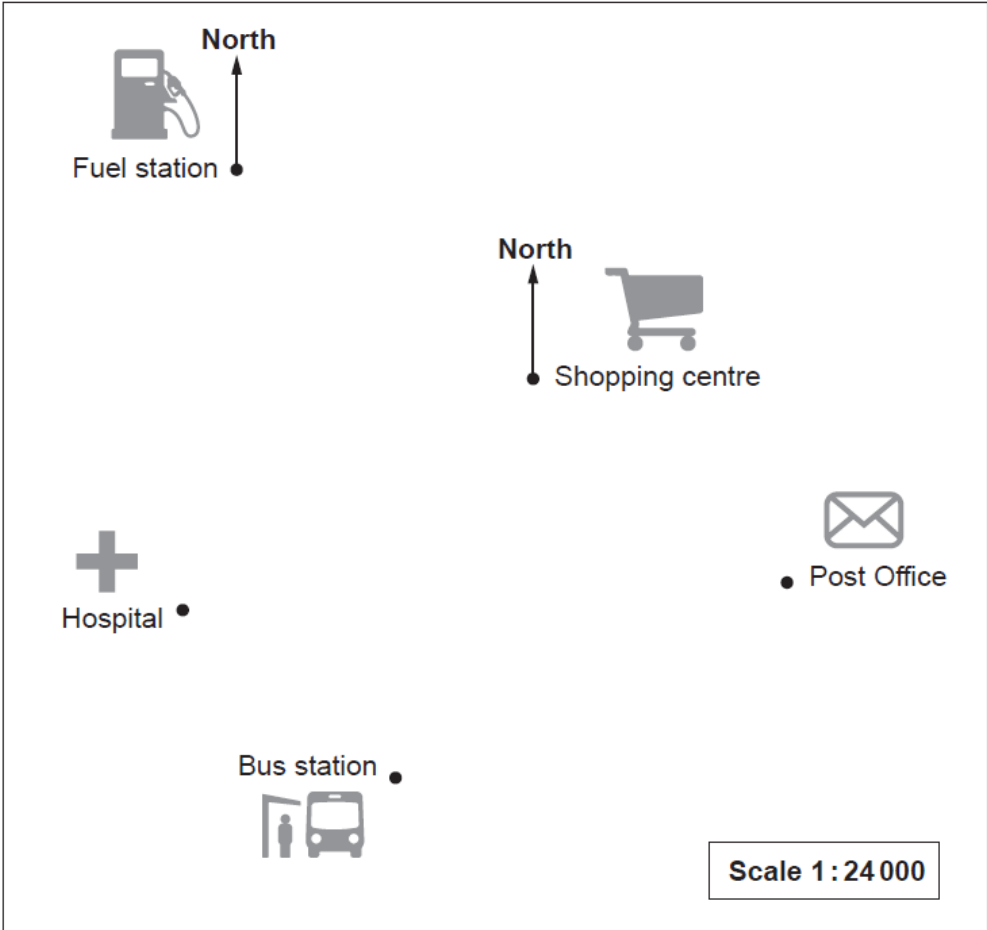
Question taken from Eduqas examination paper 5300001, November 2021

Bearings / Scale Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	5	
Total	9	

#1

The scale drawing below shows the positions of some places in a town.



- (a) What is the straight-line distance between the post office and the bus station?
Give your answer in **metres**.

[3]

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- (b) What is the bearing of the shopping centre from the fuel station?

[1]

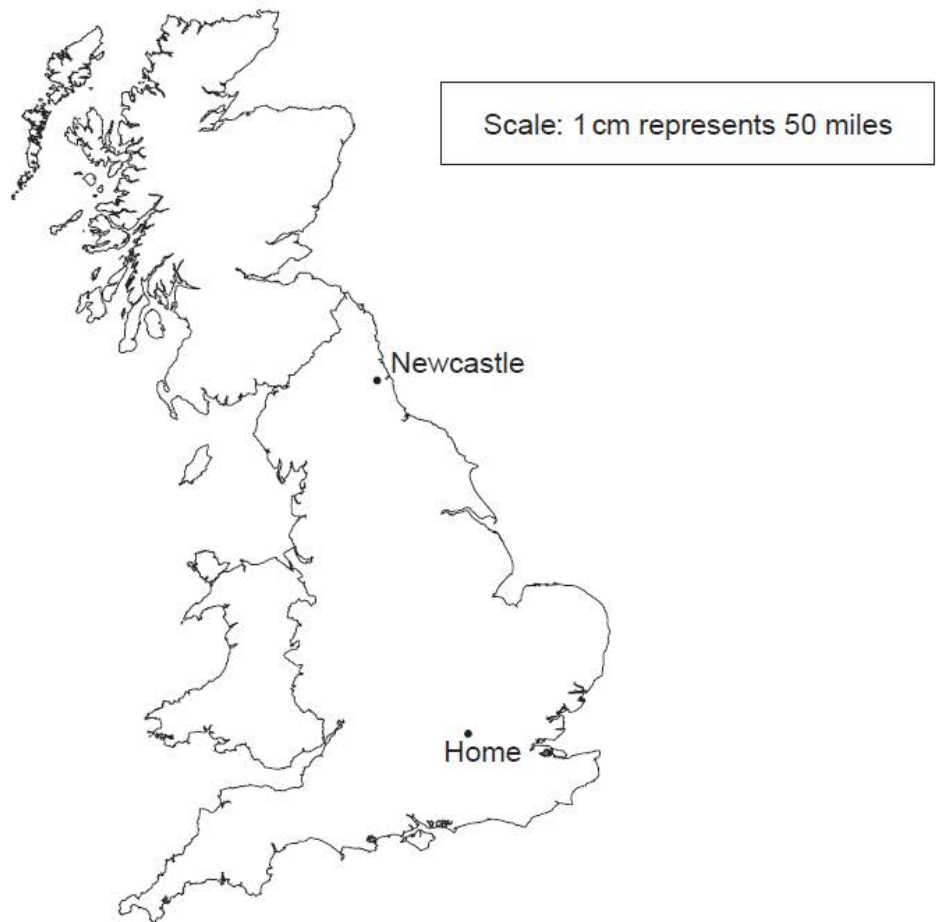
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Question taken from Eduqas examination paper 530002, June 2024

#2

Nadia is going to drive from her home to a meeting in Newcastle.



Her route can be approximated using a straight line.

She plans to leave home at 6 a.m.

She wants to arrive in Newcastle at 11:45 a.m.

What must Nadia's average speed be for her to get to Newcastle on time?
Give your answer in miles per hour.

[5]

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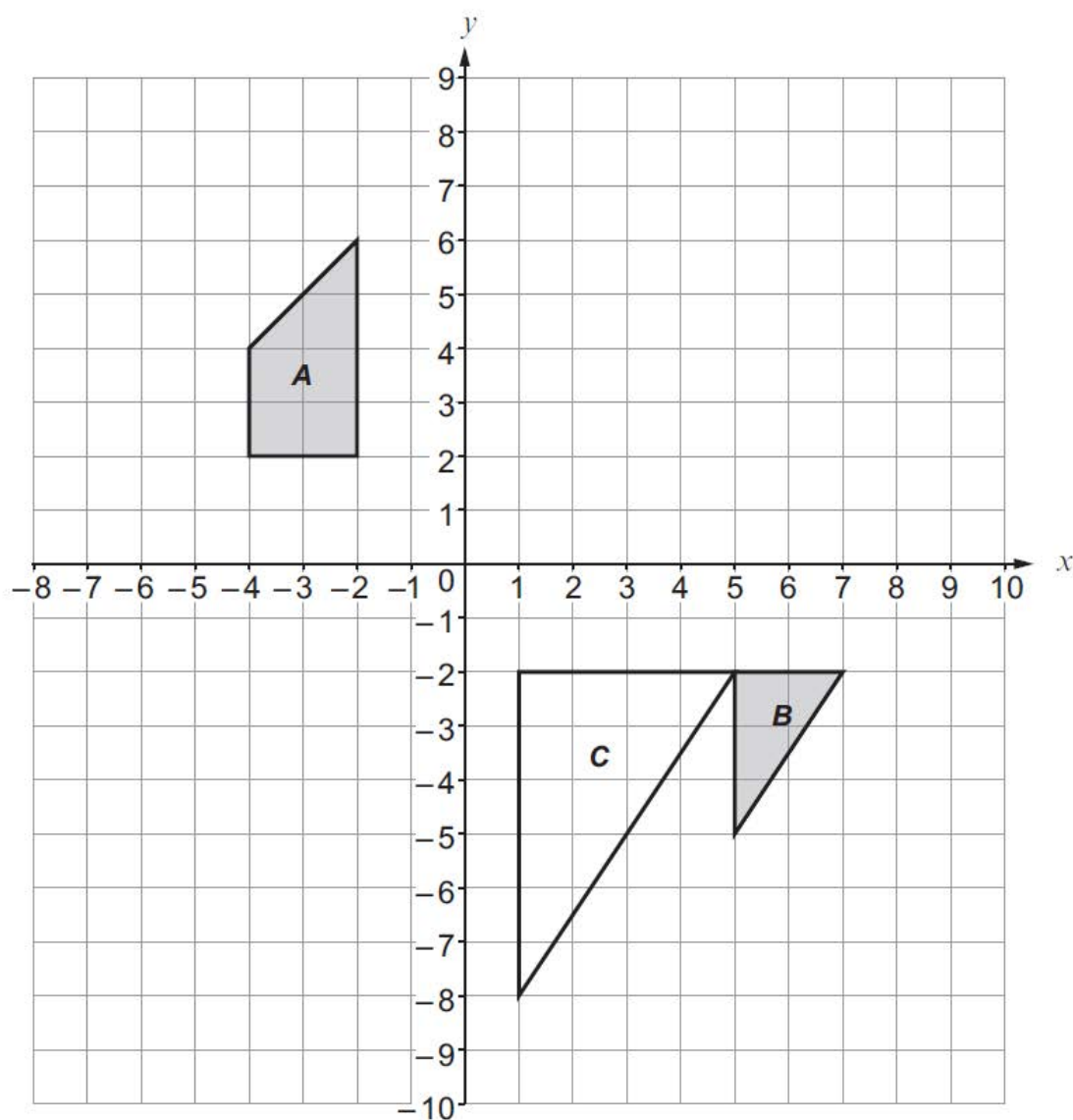
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Question taken from Eduqas examination paper 530002, November 2020

Transformations: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
Total	7	

#1

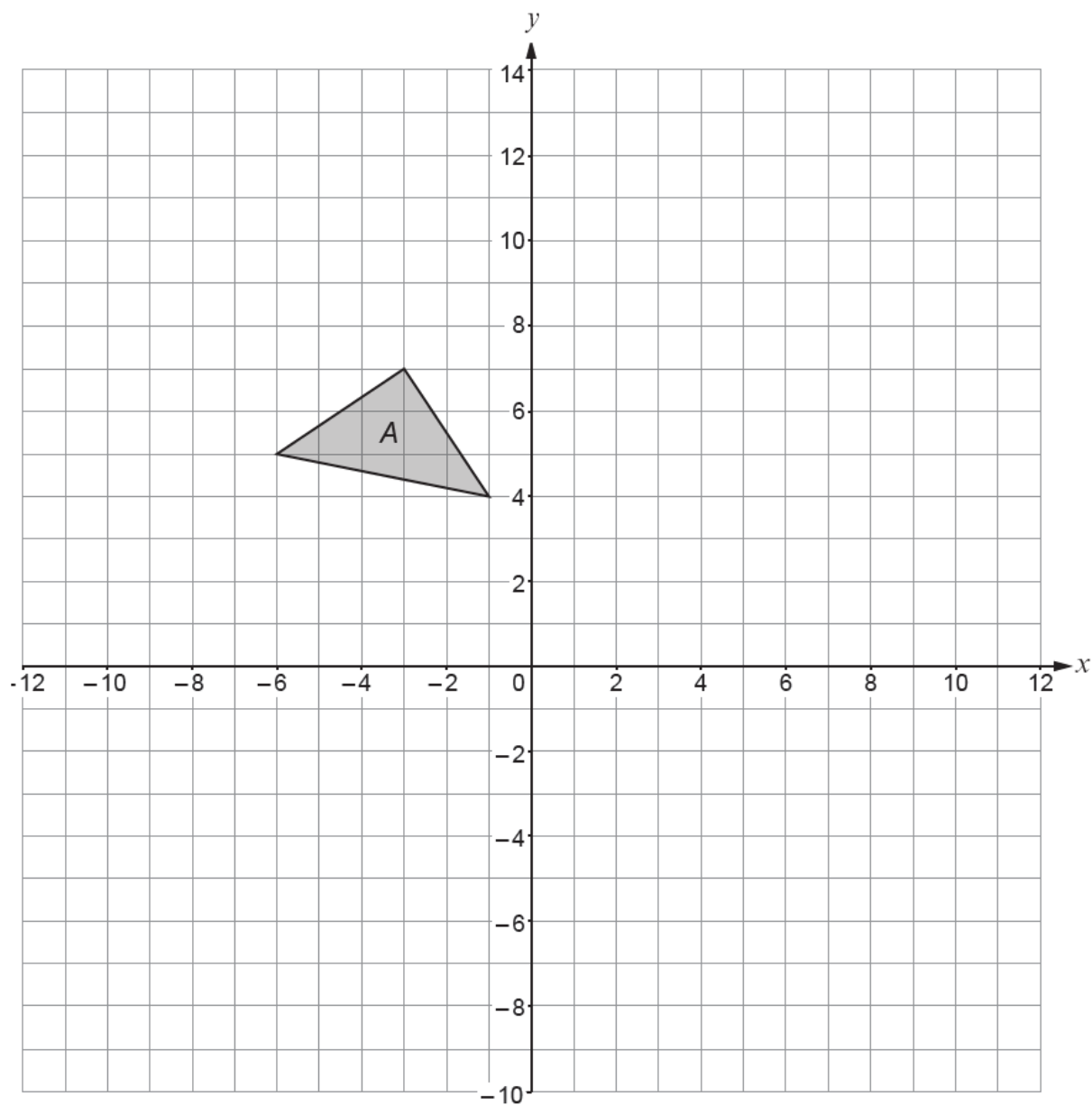


- (a) On the grid, draw the image of **shape A** after a rotation of 90° clockwise about $(0, 0)$. [2]
- (b) Triangle **C** is the image of **triangle B** after an enlargement with scale factor 2.
On the grid, mark the position of the centre of this enlargement and label it **P**. [1]

Question taken from Eduqas examination paper 530001, November 2018

#2

The diagram shows triangle A.



- (a) Reflect **triangle A** in the line $y = 4$.
Label your answer B.

[2]

- (b) Translate **triangle A** using the vector $\begin{pmatrix} 6 \\ 0 \end{pmatrix}$.
Label your answer C.

[2]

Question taken from Edugas examination paper 530001, November 2022

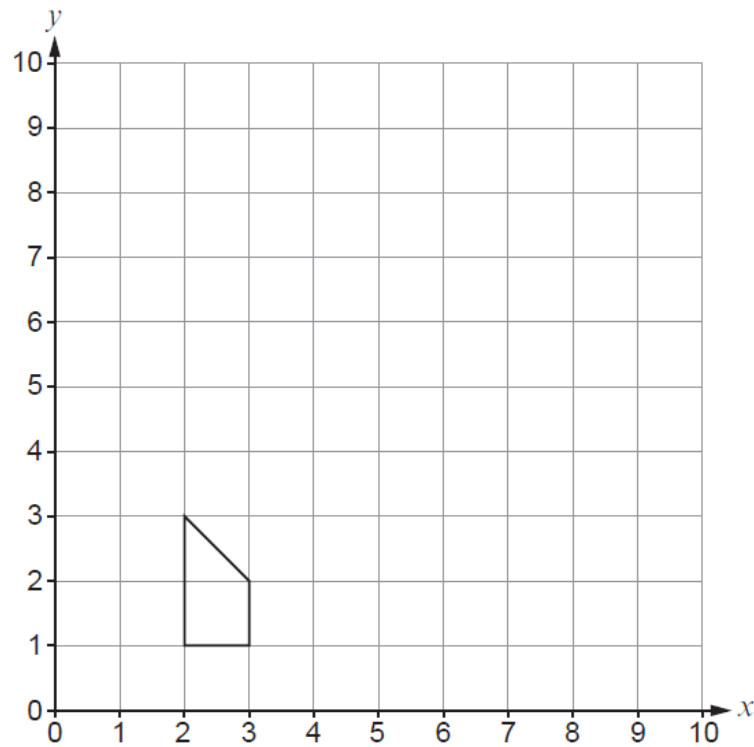
Transformations: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	4	
#5	6	
Total	21	

#1

- (a) Draw an enlargement of the shape below using a scale factor of 2 and $(0,0)$ as the centre of enlargement.

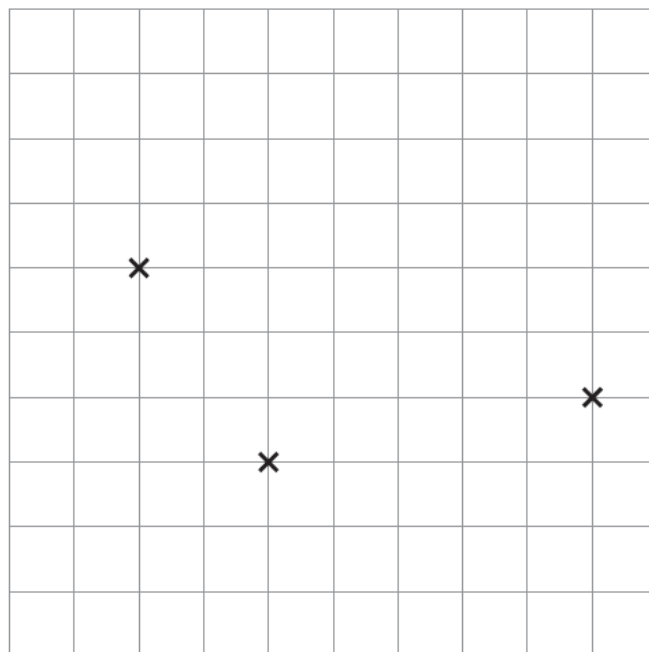
[3]



- (b) Three vertices of a parallelogram have been plotted on the grid below.

Plot the fourth vertex of the parallelogram.

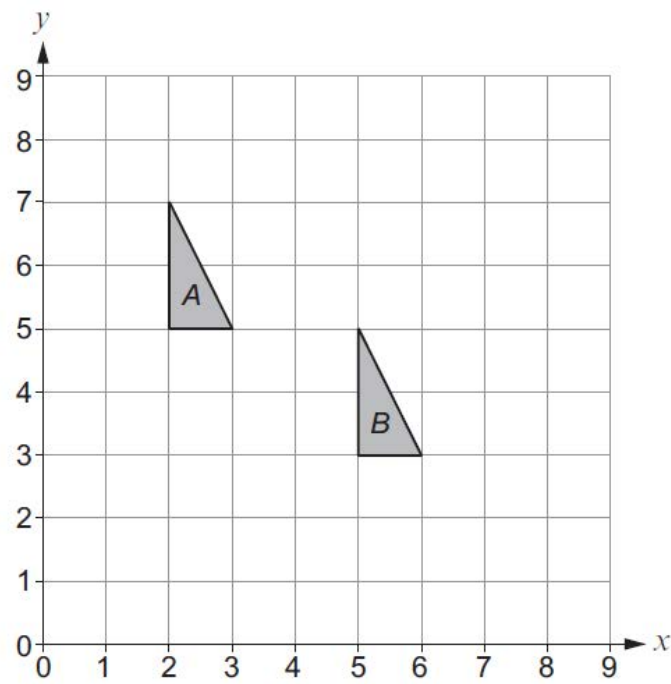
[1]



Question taken from Eduqas examination paper 530002, June 2022

#2

Two triangles, A and B , are shown on the grid below.



- (a) Describe the single transformation that transforms triangle A onto triangle B . [2]

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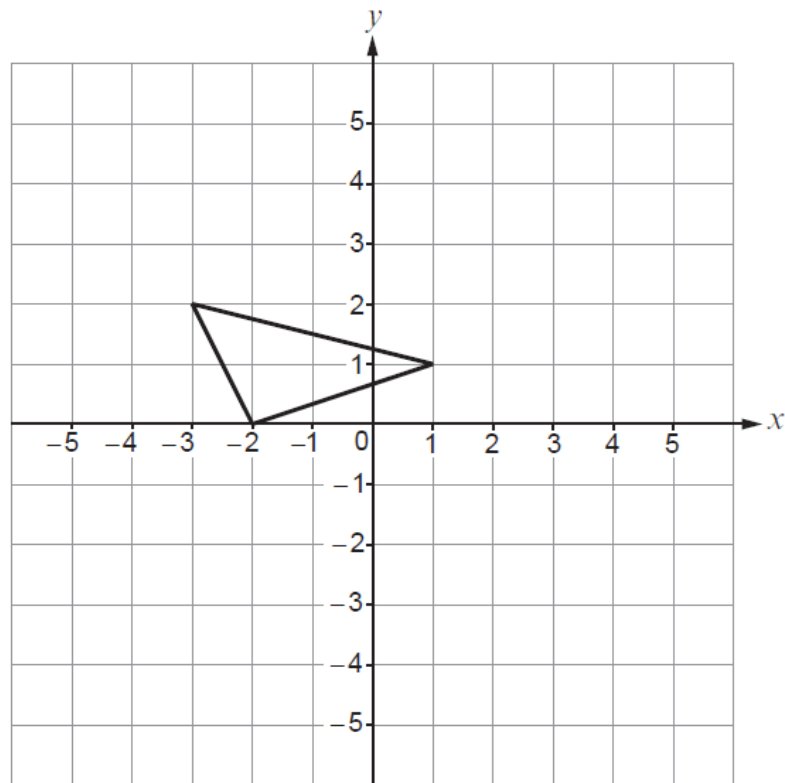
- (b) Reflect triangle A in the line $y = 4$ and label your answer C . [2]

Question taken from Eduqas examination paper 530002, June 2018

#3

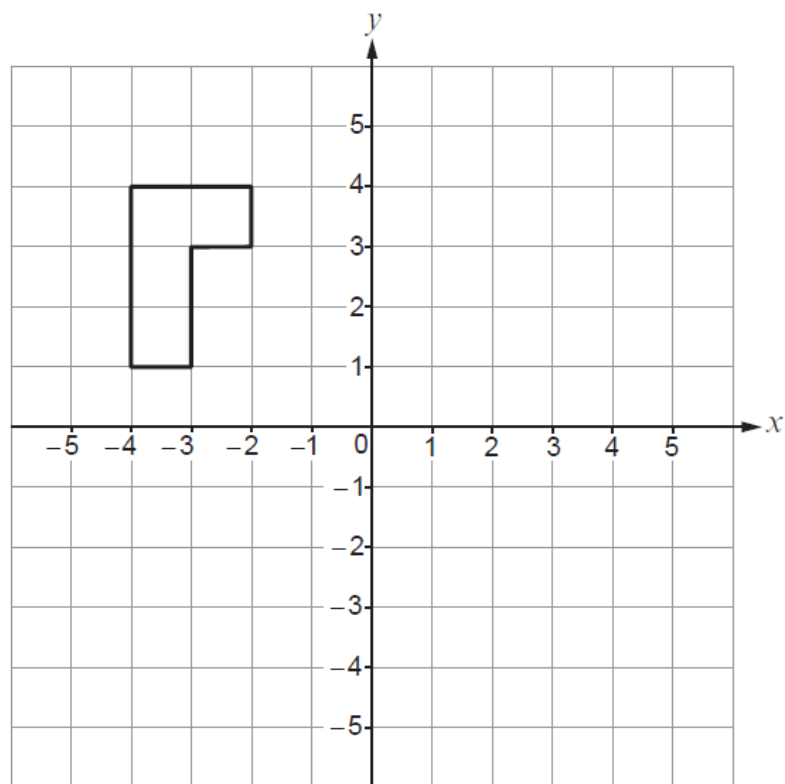
- (a) Translate this triangle using the vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.

[2]



- (b) Rotate this shape 90° clockwise about the point (0,0).

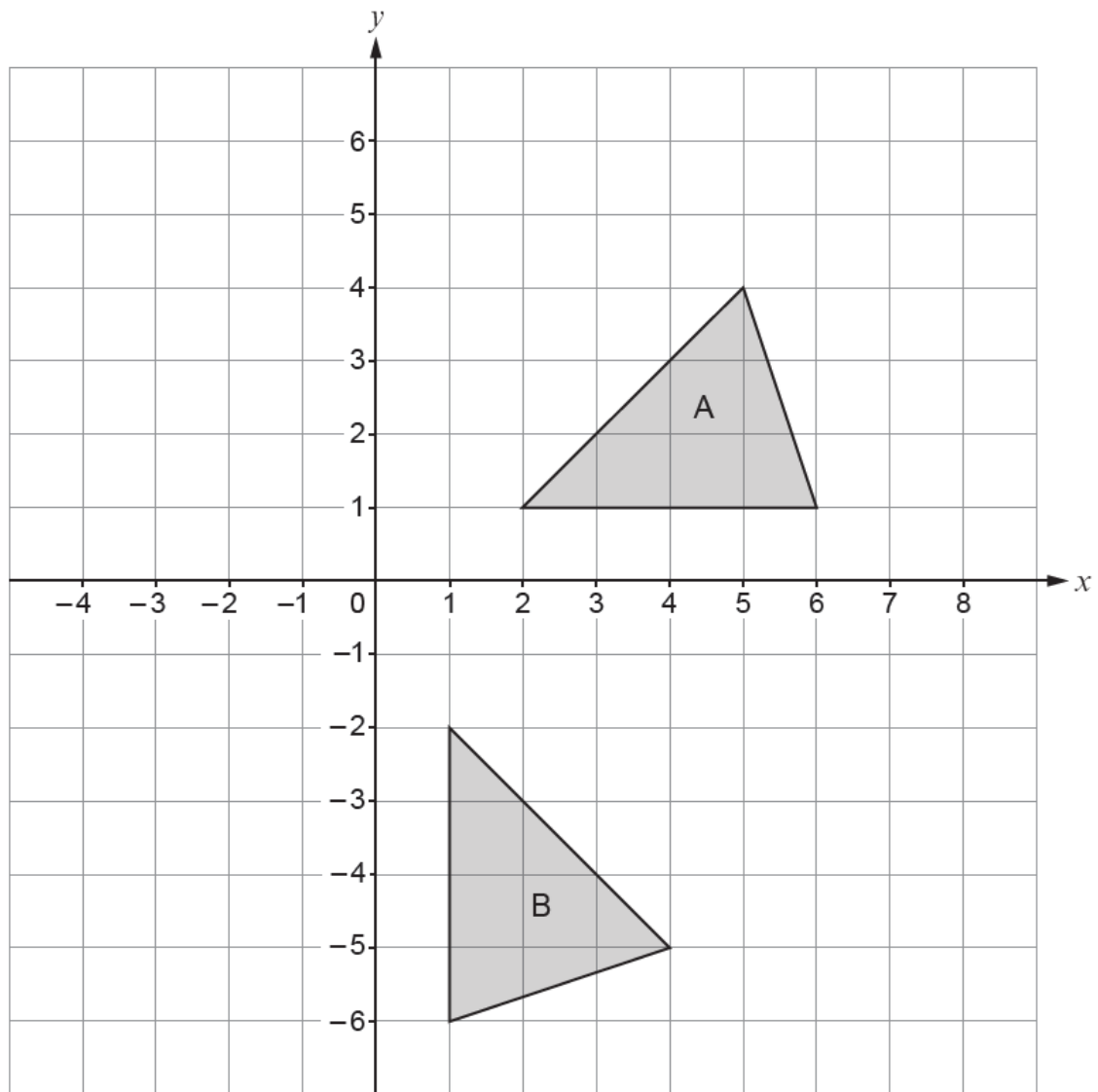
[2]



Question taken from Eduqas examination paper 530002, June 2023

#4

The grid below shows triangle A and triangle B.



- (a) Describe fully the single transformation that maps triangle A onto triangle B.

[2]

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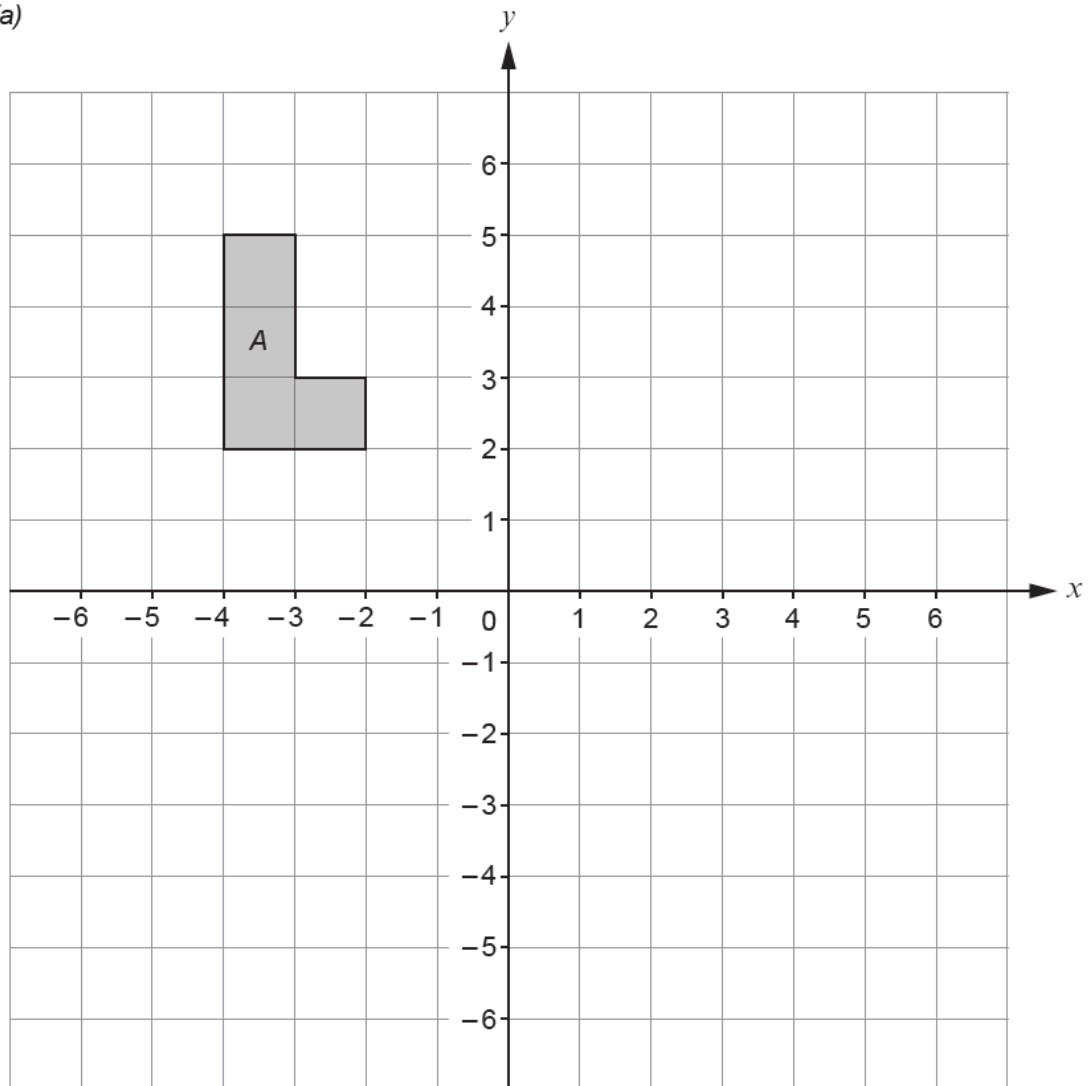
- (b) Translate triangle A using the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$, label it C.

[2]

Question taken from Eduqas examination paper 530002, November 2023

#5

(a)



$\mathbf{p}$ and $\mathbf{q}$ are translation vectors with

$$\mathbf{p} = \begin{pmatrix} 3 \\ -5 \end{pmatrix} \text{ and } \mathbf{q} = \begin{pmatrix} 1.5 \\ 2 \end{pmatrix}.$$

Shape A is mapped to shape B using $\mathbf{p} + 2\mathbf{q}$.

(i) Find the column vector which translates shape A to shape B .

[2]

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(ii) Draw and label shape B on the grid on page 32.

[2]

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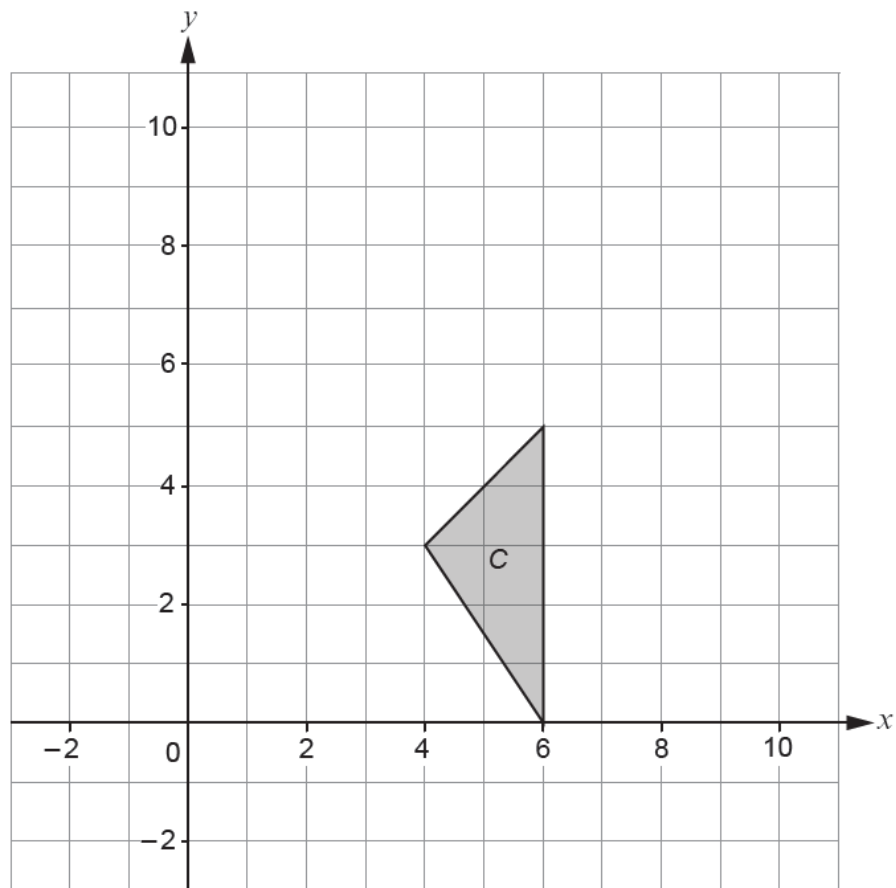
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- (b) Triangle C has vertices with coordinates $(4, 3)$, $(6, 5)$, $(6, 0)$.
After a **single** transformation, the vertices of triangle C are mapped to $(3, 4)$, $(5, 6)$, $(0, 6)$.

Describe the transformation.

[2]

You may use this grid to help you.



Transformation:

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Question taken from Eduqas examination paper 530002, November 2021

Properties of a Circle: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	6	
Total	17	

#1

Nia and David are trying to work out the area of this sector of a circle. They must give the answer as a multiple of π .

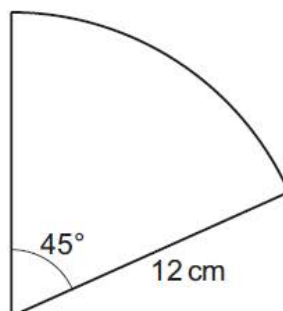


Diagram not drawn to scale

Here is Nia's answer.

- | | |
|--------|---|
| Step 1 | $360 \div 45 = 8$ |
| Step 2 | Area of whole circle = $\pi \times 24$ |
| Step 3 | Area of sector = $\frac{1}{8}$ of $24\pi = \frac{24\pi}{8}$ |
| Step 4 | Answer = $3\pi \text{ cm}^2$ |

David looks at Nia's answer and says,

'Your answer is wrong.'

- Explain the error that Nia has made.
- Calculate the correct answer as a multiple of π .

[3]

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Question taken from Eduqas examination paper 530001, June 2018

#2

- (a) Simplify $18\pi \div 9\pi$.

[1]

- (b) The diagram shows two circles, one inside the other.

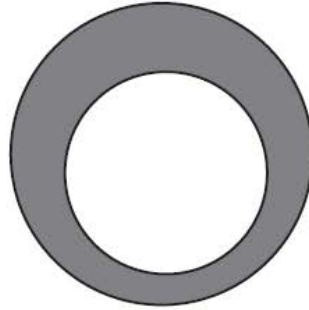


Diagram not drawn to scale

The radius of the outer circle is 6 cm.
The radius of the inner circle is 5 cm.

Work out the area of the shaded region.
Give your answer in terms of π .

[3]

Area of shaded region = cm^2

Question taken from Eduqas examination paper 530001, November 2020

#3

The shape below consists of a square surrounded by four semi-circles.
The diameter of each semi-circle is 12 cm.

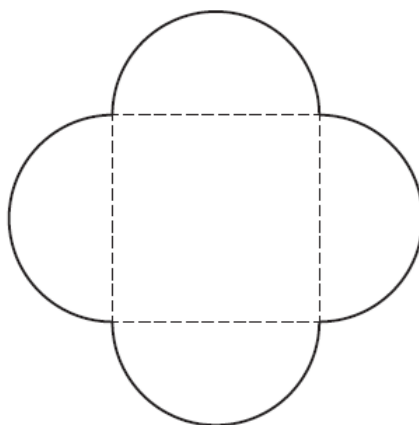


Diagram not drawn to scale

Work out the area of the shape.
Give your answer in the form $a + b\pi$.

[4]

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Area = cm^2

Question taken from Eduqas examination paper 5300001, November 2023

#4

David is laying a small circle of paving stones in his garden. The diagram shows the shape of each paving stone.

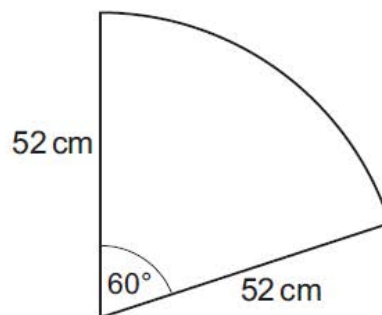


Diagram not drawn to scale

- (a) How many paving stones will David need to make a circle?

[1]

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..... paving stones

- (b) David wants his circle to be **at least** 1 metre in diameter.

Will David's circle be the size he wants?

[1]

Yes ☐ No ☐

Explain how you decide.

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- (c) David is going to fill the space around the paving stones with gravel. He works out that he needs 18 small bags of gravel.

Green Garden Centre
Offer of the week
Any small bag of gravel £7.19
Buy 3 bags for the price of 2

- (i) **Estimate** how much David will have to pay in total for his gravel from Green Garden Centre.
You must show all your working. [3]

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Estimate £

- (ii) Is your answer to part (i) an over-estimate or an under-estimate of the cost of David's gravel?

Over-estimate

☐

Under-estimate

☐

Give a reason for your decision.

[1]

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Question taken from Eduqas examination paper 530001, November 2018

Properties of a Circle: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	4	
#4	4	
#5	4	
#6	5	
#7	5	
#8	5	
#9	5	
#10	6	
Total	42	

#1

Gregor owns a restaurant.

- (a) The diagram shows a circular place mat.



Diagram not drawn to scale

The radius of the circular place mat is 14 cm.

Calculate the circumference of the circular place mat.

[2]

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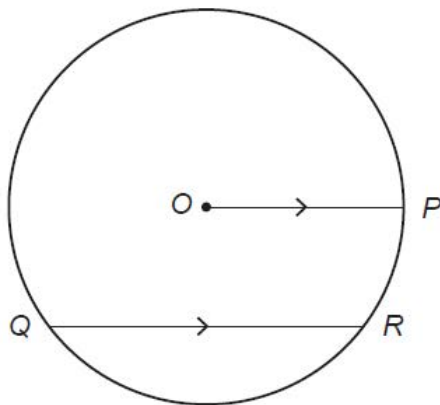
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Question taken from Eduqas examination paper 530002, November 2018

#2

- (a) The diagram shows a circle with centre O .
 P , Q and R are points on the circle.



tangent	radius
area	chord
diameter	circumference
parallel	perpendicular

Choose words from the box to complete these sentences.

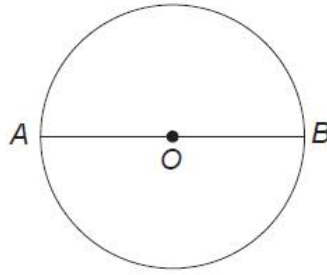
- (i) Line OP is a
- (ii) Line QR is a
- (iii) Lines OP and QR are

[2]

Question taken from Eduqas examination paper 530002, November 2019

#3

- (b) Points A and B are on the circumference of a circle with centre O . Points A , O and B lie on a straight line.



Circle the special name for the straight line AB .

[1]

circumference

diameter

tangent

radius

arc

- (c) Six slices of pizza are shown in the diagram below.

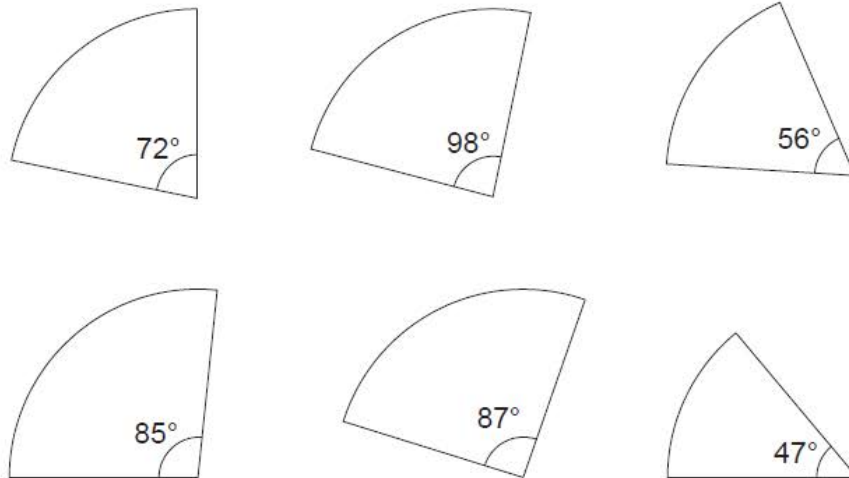


Diagram not drawn to scale

Five of the slices make one whole pizza.

One of the slices in the bottom row is from a different pizza.

Which slice is from the different pizza?

You must show all your working.

[3]

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Question taken from Eduqas examination paper 530002, June 2019

#4

The circumference of a circle is 40·841 cm.

Find the area of this circle.

You must show all your working.

[4]

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Area of circle = cm²

Question taken from Eduqas examination paper 530002, November 2021

#5

- (a) The diagram shows a circle inside a square of side 8.2 cm .

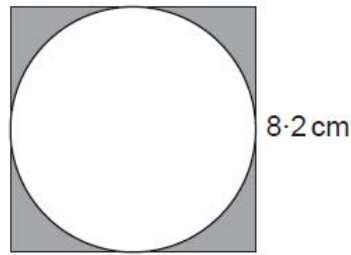


Diagram not drawn to scale

The sides of the square are tangents to the circle.

Find the area of the shaded region.
You must show all your working.

[4]

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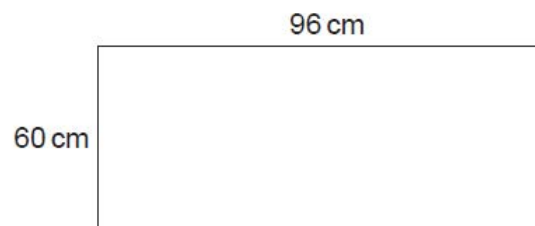
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Question taken from Eduqas examination paper 530002, June 2023

#6

Jan has a large piece of card.
The card has width 60 cm and length 96 cm .



She uses a machine to cut identical circles out of the card.
Each circle has a radius of 6 cm.

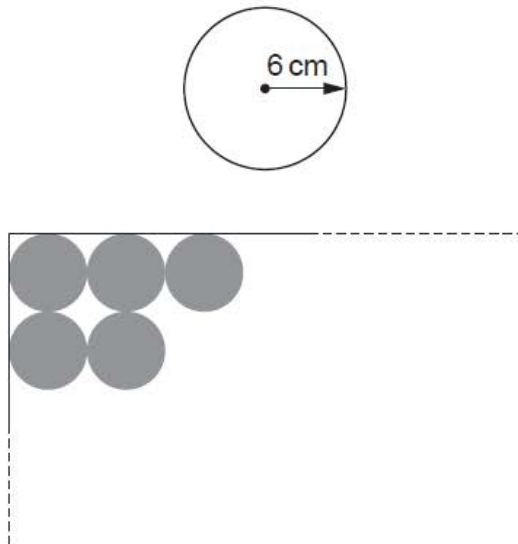


Diagram not drawn to scale

Jan has cut five circles as shown on the diagram above.
She continues in this way to cut as many circles as possible from the card.

- (a) What is the maximum number of circles Jan can cut out of the card? [1]

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- (b) Jan cuts out the maximum number of circles from the card.
What area of card is left over? [4]

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Area of card left over

Question taken from Eduqas examination paper 530002, November 2023

#7

Amy and Vance each buy a thin pizza.

Amy's pizza has a radius of 3 inches.

Vance's pizza has a radius of 5 inches.

Amy eats one half of her pizza.

Vance eats one quarter of his pizza.

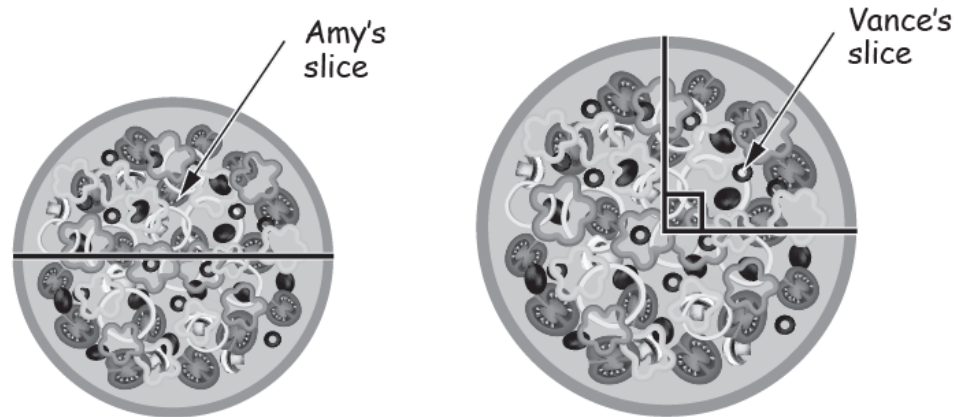


Diagram not drawn to scale

Who eats the slice of pizza with the greater area?

Amy

7

Vance

1

You must show all your working.

[5]

Question taken from Eduqas examination paper 530002, June 2022

#8

A circular wheel makes 42 complete turns each minute.

(a) How many degrees does it turn through in one second?

[3]

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(b) (i) State **one** assumption you have made in your answer to part (a).

[1]

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(ii) How would your answer to part (a) change if this assumption was not correct? [1]

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Question taken from Eduqas examination paper 530002, June 2022

#9

(a)



A bicycle wheel has a diameter of 700 mm.

Calculate the circumference of the wheel.

[2]

(b) A different wheel has a circumference of 1600 mm.

This wheel is rolled along the ground to measure distance.

A mark is made on the ground as the wheel completes each turn.

How far apart are the first and fourth marks?

Give your answer in metres.

[3]

Question taken from Eduqas examination paper 530002, June 2018

#10

- (b) The diagram shows a shape made from a trapezium and a circle.

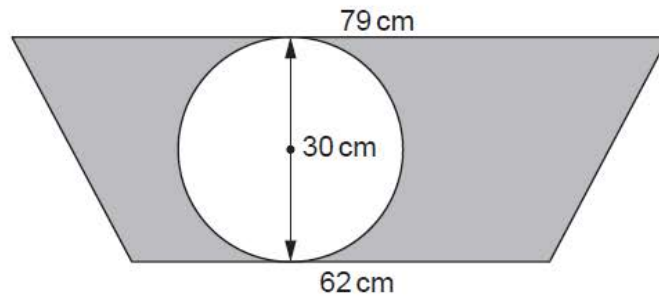


Diagram not drawn to scale

The parallel sides of the trapezium are tangents to the circle.
The diameter of the circle is 30 cm.

The ratio of the white area to the shaded area is as follows.

$$\begin{array}{ccc} \text{white area} & : & \text{shaded area} \\ 1 & : & k \end{array}$$

Find the value of k .

Show all your working and give your answer correct to 1 significant figure.

[6]

Question taken from Edugas examination paper 530002, November 2022

Volume of a Cylinder: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
Total	6	

#1

Elijah has a large cylinder of wax.
It has a radius of 7 cm and a height of 21 cm.

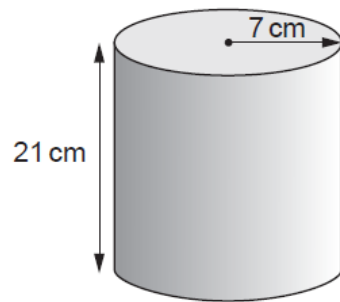


Diagram not drawn to scale

He melts down the large cylinder of wax to make small wax cylinders each with a volume of 102 cm^3 .

How many complete small wax cylinders can Elijah make?

[3]

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Question taken from Eduqas examination paper 530002, November 2024

#2

A cylindrical glass contains 500 cm^3 of water.
The glass has an internal radius of 3.5 cm .

Calculate the height of the water in the glass.



[3]

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Question taken from Eduqas examination paper 530002, November 2020

Volume of a Cone / Sphere: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	7	
Total	7	

#1

The diagram shows a cone placed with its circular base on a table.

It has

- base radius 15 cm,
- height 30 cm.

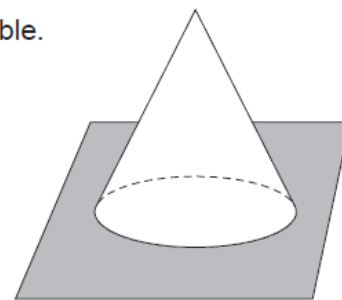


Diagram not drawn to scale

- (a) Work out the volume of this cone.
Give your answer as a multiple of π .

[3]

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Volume is cm^3

- (b) On the 1 cm grid opposite, make an accurate scale drawing of the plan and side elevation of this cone.

Use the ratio

actual cone : scale drawing = 5 : 1.

[4]

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Plan



Side elevation



Question taken from Eduqas examination paper 530001, May 2022

Pythagoras: Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	5	
#3	6	
Total	16	

#1

(b)

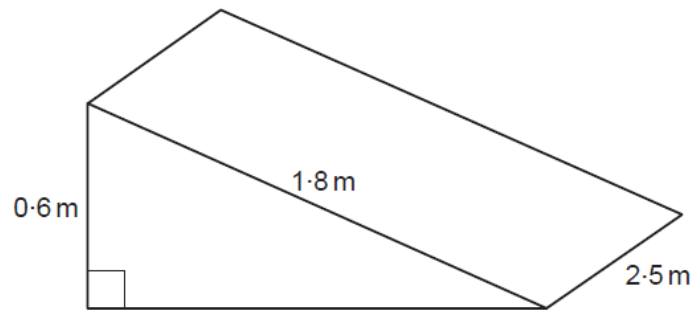


Diagram not drawn to scale

The diagram shows a concrete ramp to a different building.
It was not approved and needs to be completely removed.

The ramp is a triangular prism and is 2.5 m wide.

How many cubic metres of concrete will need to be removed?
You must show all your working.

[5]

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Question taken from Eduqas examination paper 530002, November 2021

#2

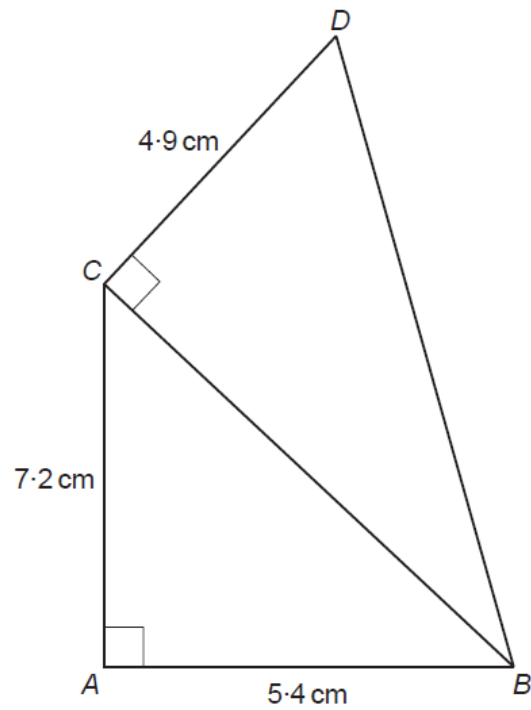


Diagram not drawn to scale

ABC and BCD are right-angled triangles.
 $AB = 5.4$ cm, $AC = 7.2$ cm and $CD = 4.9$ cm.

Calculate the area of triangle BCD .

[5]

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Area of triangle BCD is cm^2

Question taken from Eduqas examination paper 530002, June 2024

#3

A right-angled triangle and a square are shown below.

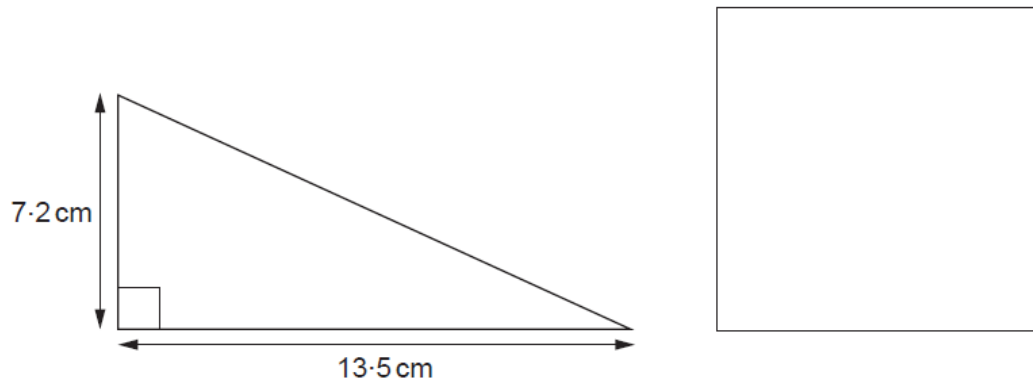


Diagram not drawn to scale

The perimeter of the triangle is equal to the perimeter of the square.

Calculate the area of the square.
You must show all your working.

[6]

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Area of square = cm^2

Question taken from Eduqas examination paper 530002, November 2024

Trigonometry: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	4	
#4	5	
#5	6	
#6	6	
#7	6	
#8	7	
Total	40	

#1

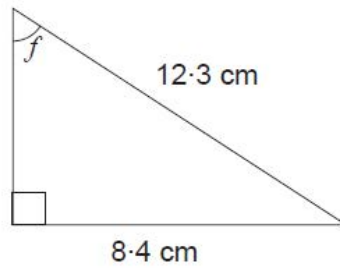


Diagram not drawn to scale

Calculate the size of angle f .

[3]

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Question taken from Eduqas examination paper 530002, June 2019

#2

- (a) The diagram shows the side view of a design for a ramp to a building.

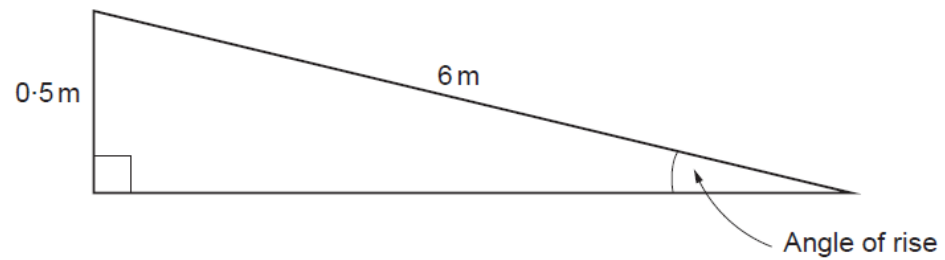


Diagram not drawn to scale

For the design to be approved, the angle of rise must not be more than 4.8° .

Use calculations to show that the design should be approved.

[3]

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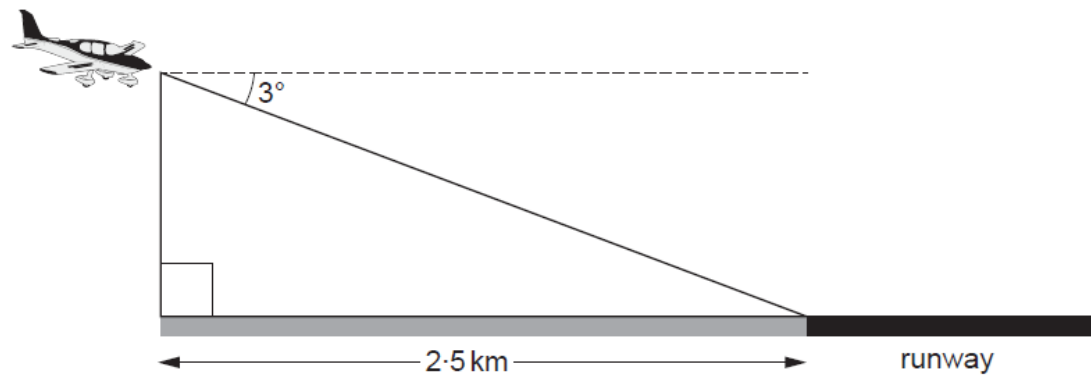
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Question taken from Eduqas examination paper 530002, November 2021

#3



An aircraft is making its final approach ready to land.

The aircraft is:

- flying at 3° to the horizontal,
 - 2.5 km horizontally from the start of the runway,
- as shown on the diagram above.

Calculate the vertical height of the aircraft above the horizontal ground.
You must show all your working.

[4]

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Question taken from Eduqas examination paper 530002, June 2023

#4

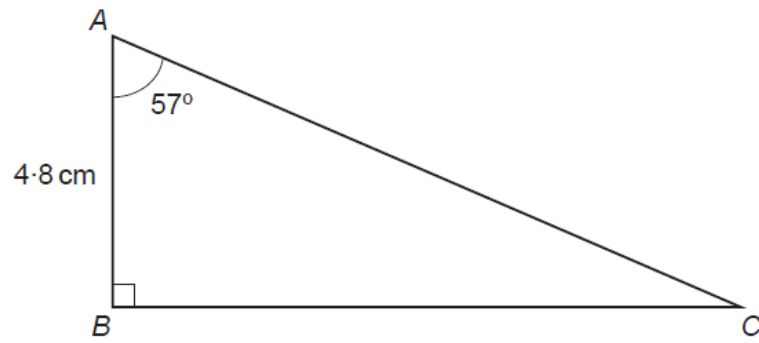


Diagram not drawn to scale

ABC is a right-angled triangle.

$AB = 4.8 \text{ cm}$ and $\hat{BAC} = 57^\circ$.

Calculate the area of triangle ABC .

[5]

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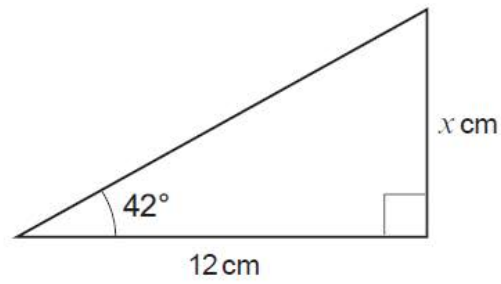
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Area = cm^2

Question taken from Eduqas examination paper 530002, June 2022

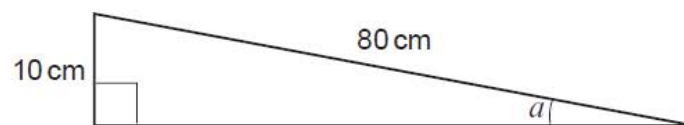
#5

(a)

*Diagram not drawn to scale*Calculate the value of x .

[3]

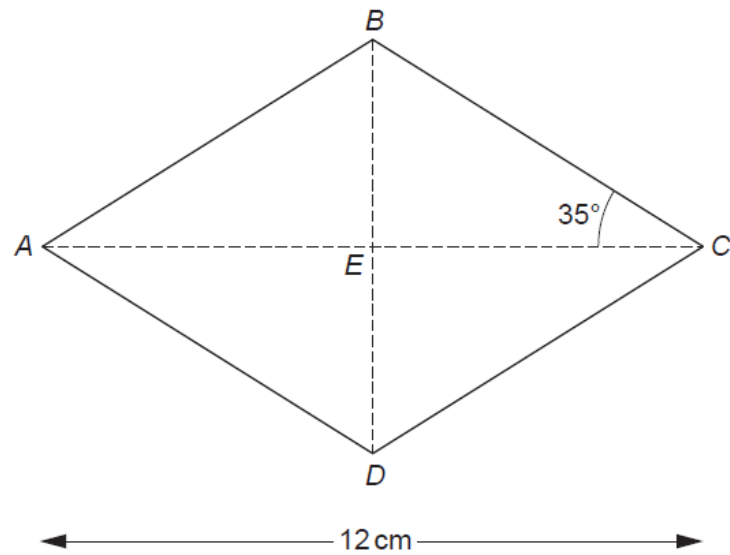
(b)

*Diagram not drawn to scale*Calculate the size of angle a .

[3]

Question taken from Eduqas examination paper 530002, November 2018

#6

Diagram not
drawn to scale

The diagram shows a rhombus, $ABCD$.

AC and BD intersect at E .

The length of AC is 12 cm.

$\angle BCE$ is 35° .

Find the perimeter of $ABCD$.

[6]

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Perimeter of $ABCD$ = cm

Question taken from Eduqas examination paper 530002, November 2022

#7

Vaughan cycles down a track from the top of a mountain to the bottom. The track goes down at an angle of 48° to the horizontal. Vaughan is 800 feet above ground level.

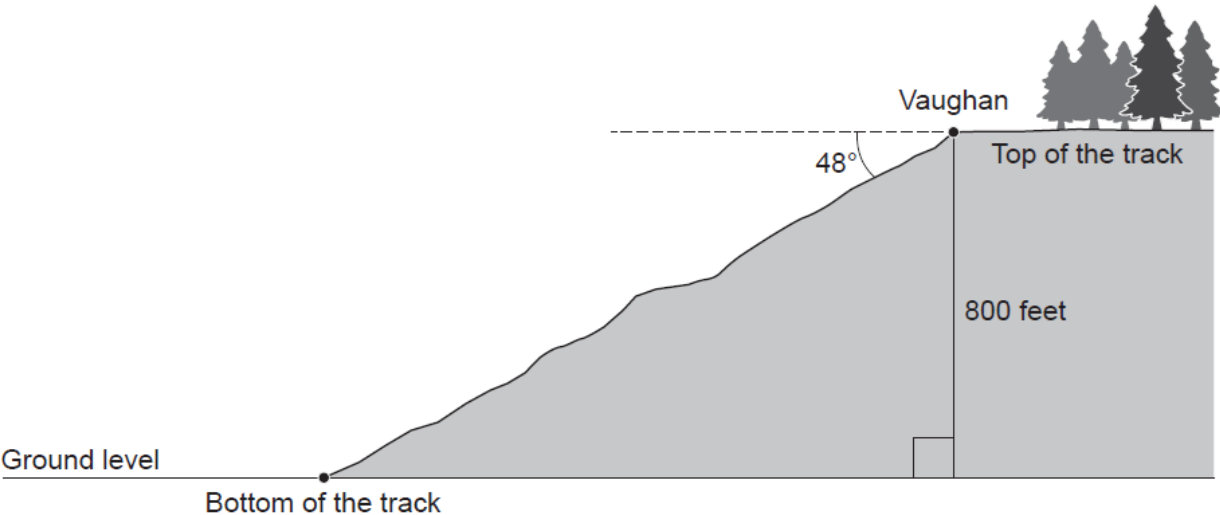


Diagram not drawn to scale

- (a) Vaughan cycles from the top of the track to the bottom of the track. What distance has he cycled? [4]

The distance Vaughan has cycled is feet.

- (b) (i) State an assumption you have made in answering part (a). [1]

- (ii) If your assumption is not correct, what effect would this have on your answer to part (a)? [1]

Question taken from Eduqas examination paper 530002, November 2023

#8

- (a) Shireen has a new shed.

The walls of the shed are vertical.
The shed stands on horizontal ground.
The uniform cross-section has one line of symmetry.

The diagram below shows some of the measurements of the cross-section.

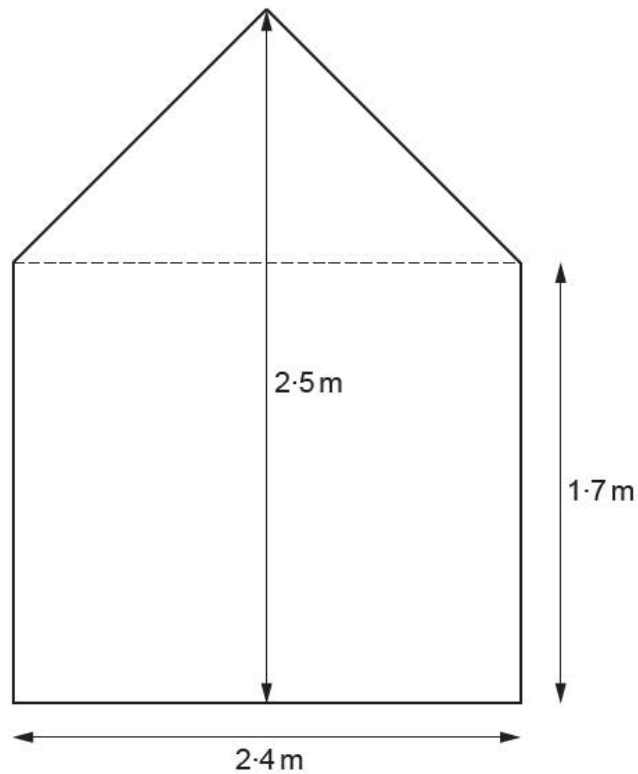


Diagram not drawn to scale

Calculate the size of the angle between the roof of the shed and the horizontal.

[4]

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- (b) Petra has a mathematically similar shed.

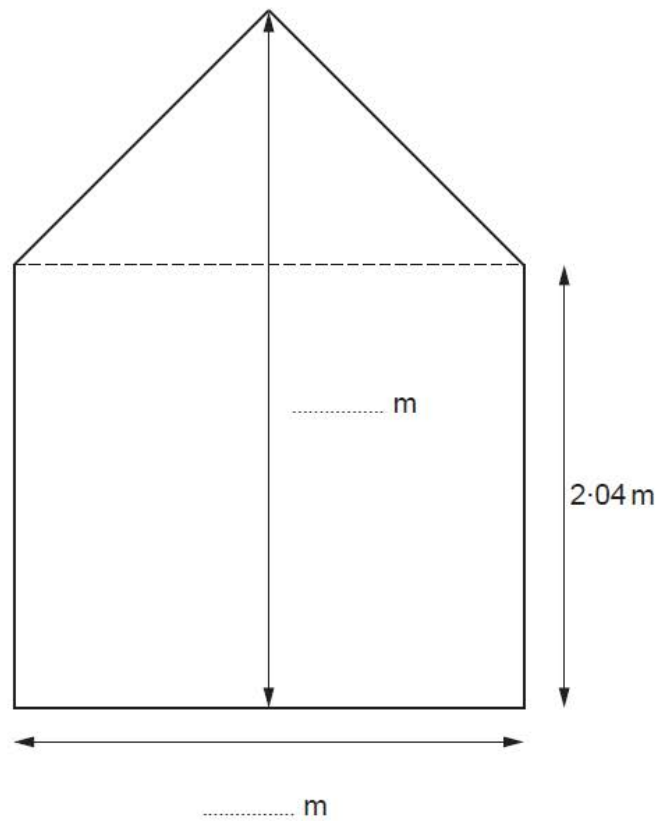


Diagram not drawn to scale

Calculate the two missing measurements on the diagram above.
You must show all your working.

[3]

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Question taken from Eduqas examination paper 530002, November 2019

Pythagoras / Trigonometry Combined: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

#1

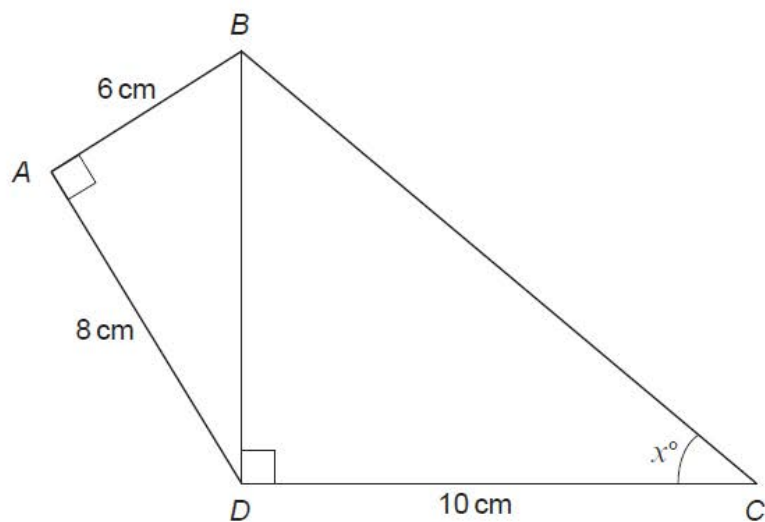


Diagram not drawn to scale

Find the value of x .
You must show all your working.

[3]

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$x =$

Question taken from Eduqas examination paper 530001, November 2019

Pythagoras / Trigonometry Combined: Calculator

Question	Maximum Mark	Mark Awarded
#1	6	
#2	6	
Total	12	

#1

The diagram shows two right-angled triangles.

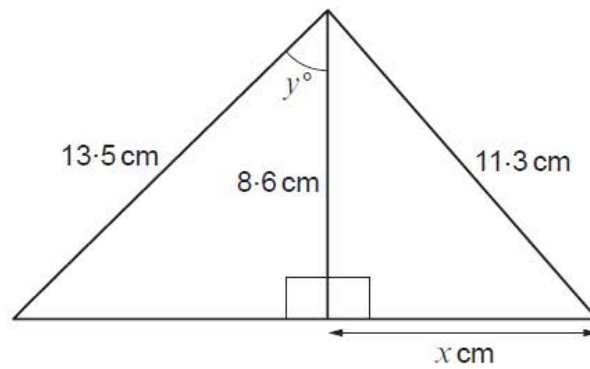


Diagram not drawn to scale

(a) Calculate the value of x .

[3]

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(b) Calculate the value of y .

[3]

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Question taken from Eduqas examination paper 530002, November 2020

#2

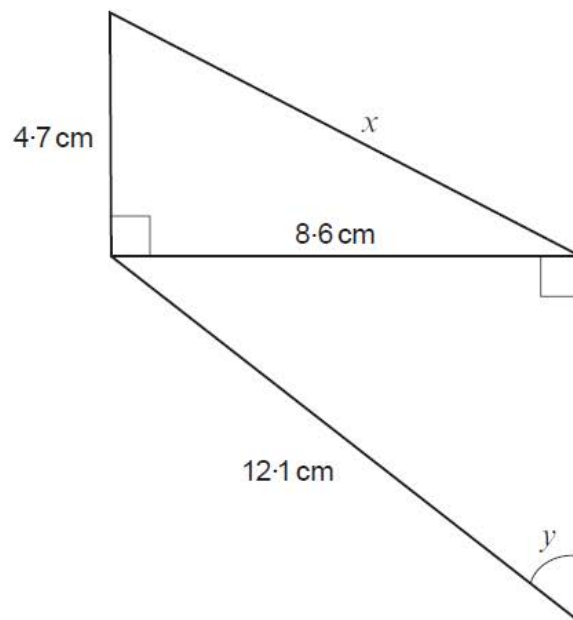


Diagram not drawn to scale

(a) Calculate the length x .

[3]

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(b) Calculate the size of angle y .

[3]

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Question taken from Eduqas examination paper 530002, June 2018

Exact Trigonometric Values: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
Total	1	

#1

Circle the correct value of $\tan 45^\circ$.

[1]

0

$\frac{\sqrt{3}}{3}$

$\frac{\sqrt{2}}{2}$

1

$\sqrt{3}$

Question taken from Eduqas examination paper 530001, June 2018

Vectors: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	3	
Total	5	

#1

$\mathbf{p} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} -3 \\ 2 \end{pmatrix}$

Work out the column vector $\frac{1}{2}\mathbf{p} - \mathbf{q}$. [2]

$\frac{1}{2}\mathbf{p} - \mathbf{q} = \begin{pmatrix} \\ \end{pmatrix}$

Question taken from Eduqas examination paper 530001, June 2019

#2

$\mathbf{p} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}, \mathbf{q} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$

Find the values of m and n such that $m(\mathbf{p} + \mathbf{q}) = \begin{pmatrix} 5 \\ n \end{pmatrix}$. [3]

$m = \dots\dots\dots n = \dots\dots\dots$

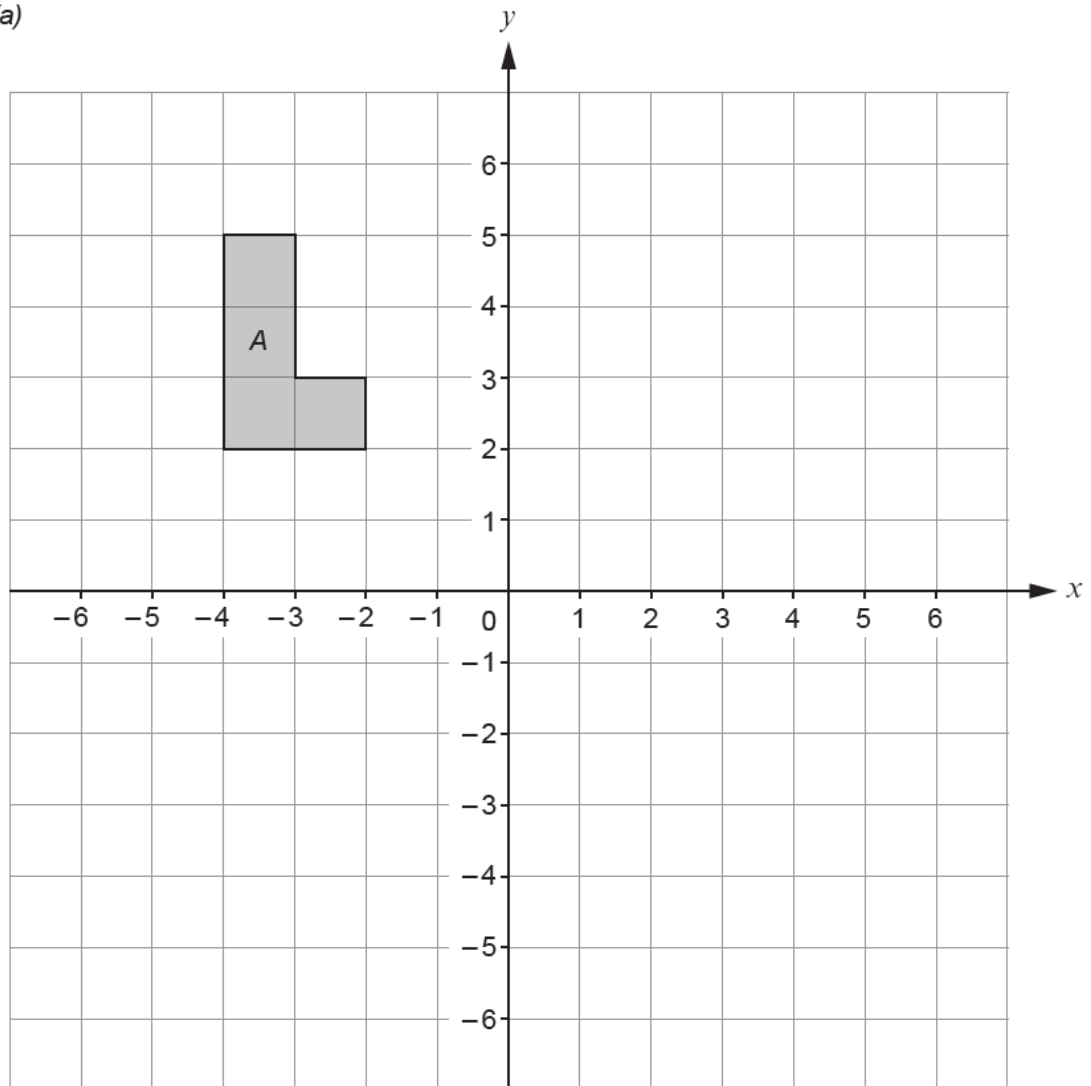
Question taken from Eduqas examination paper 530001, November 2024

Vectors: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

#1

(a)



$\mathbf{p}$ and $\mathbf{q}$ are translation vectors with

$$\mathbf{p} = \begin{pmatrix} 3 \\ -5 \end{pmatrix} \text{ and } \mathbf{q} = \begin{pmatrix} 1.5 \\ 2 \end{pmatrix}.$$

Shape A is mapped to shape B using $\mathbf{p} + 2\mathbf{q}$.

(i) Find the column vector which translates shape A to shape B .

[2]

.....

.....

.....

.....

.....

Question taken from Eduqas examination paper 530002, November 2021

Properties of 2D / 3D Shapes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
Total	4	

Marking Scheme

#1

Component 1: Foundation Tier	Mark	Comment
Second and fifth statements indicated and no others	B2	B1 for each if only two statements indicated OR for exactly three statements indicated of which two are correct
	(2)	

#2

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a)(i) cuboid	B1	Do not accept rectangular prism or square based prism
(a)(ii) 8	B1	

Properties of 2D / 3D Shapes: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	1	
#3	2	
#4	3	
#5	3	
#6	4	
#7	4	
Total	18	

Marking Scheme

#1

Eduqas Summer 2018 C2 Foundation Tier	Mark	Comment
equilateral (triangle)	B1	

#2

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a) $2 \times 2 \times 5$ or $1 \times 4 \times 5$ or $1 \times 2 \times 10$ or $1 \times 1 \times 20$ oe	B1	Accept any clear representation of correct dimensions

#3

(a) Cube	B1	
(b) B	B1	
	(2)	

#4

(b)(i) (isosceles)Trapezium	B1	CAO, but accept incorrect spelling.
(b)(ii) Completes a parallelogram with an area of 12cm^2 .	B2	B1 for any parallelogram B1 for area of 12cm^2 . Must use the given line for B2

#5

Component 2: Foundation Tier	Mark	Comment
(b)		
(i) C	B1	
(ii) A	B1	
(iii) B and D	B1	In any order

#6

Component 2: Foundation Tier	Mark	
(c) (Edges) 9 (Vertices) 6	B2	B1 for either correct. If no marks, award SC1 for reversed answers.
(d) All four of the remaining shapes matched correctly Rectangle Rhombus Trapezium Kite Hexagon	B2	B1 for three of the remaining shapes matched correctly OR for 2 correct with no errors.

#7

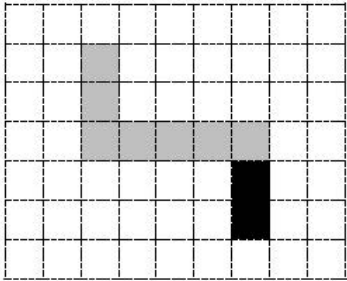
GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(b)(i) Diameter	B1	Accept any unambiguous indication
(b)(ii) Perpendicular	B1	
(b)(iii) Parallel	B1	
(c) cuboid triangular prism cube <u>square-based pyramid</u> cone	B1	Accept any unambiguous indication

Symmetry / Rotational Symmetry: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
Total	3	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a) Correct diagram: 	B1	Can be freehand

#2

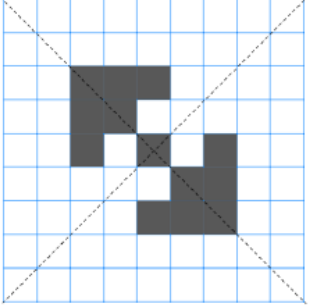
(a)	Correct reflection	B1	Allow freehand; mark intent
(b)	Parallelogram drawn	B1	Allow freehand; mark intent
		(2)	

Symmetry / Rotational Symmetry: Calculator

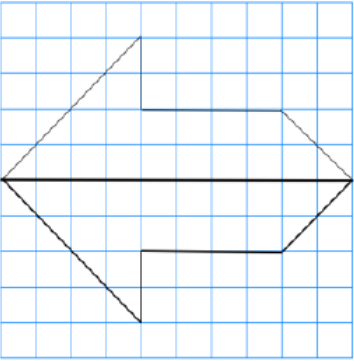
Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	3	
Total	7	

Marking Scheme

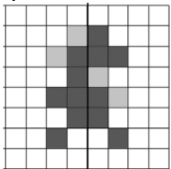
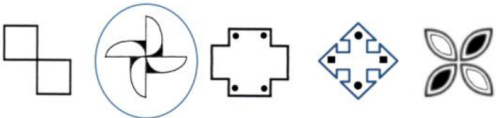
#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(d) Both lines drawn with no incorrect lines. 	B2	Mark intention. Allow if only drawn for the shape not the grid. B1 for one of the following: - One correct line with no more than one incorrect line. - Two correct lines and only one incorrect line.

#2

Component 2: Foundation Tier	Mark	Comment
(a) The correct shape 	B1	Allow a good freehand drawing. Allow a dotted line.
(c) The correct shape circled or clearly indicated. 	B1	

#3

Component 2: Foundation Tier	Mark	
(a) The correct 4 squares shaded 	B2	B1 for one of the following: • A symmetrical shape with the 4 correct squares and no more than 2 extra squares. • 3 or 4 of the correct squares and no more than 1 incorrect square. • 2 correct squares and no incorrect squares.
(b) The correct shape unambiguously indicated 	B1	

Angles Properties: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
#3	4	
#4	5	
#5	5	
Total	22	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a) $\frac{360-128}{2}$ or $180-\frac{128}{2}$ (= 116)	M2	Or M1 for $360 - 128$ (= 232) or $128 \div 2$ (= 64)
$\frac{180-116}{2}$	m1	FT 'their 116' ; dependent on M2
32	A1	<u>Alternative method using exterior angles:</u> $128 \div 2$ M1 64 is $BAC + ABC$ seen or implied and $64 \div 2$ M2 32 A1

#2

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
$a = 30$ $b = 120$	B1 B1	Angles may be marked on diagram
$c = 360 - 85 - 90 - 120$ oe	M1	FT 'their b ' providing <i>their b</i> < 185; may be in stages;
$c = 65$	A1	FT $185 -$ 'their b ' providing <i>their b</i> < 185; not from clearly wrong working
		If no marks, award SC1 for at least one of the angles of PQR marked or implied as 60 with no angle marked as an incorrect value
	(4)	

#3

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
$\widehat{ACB} = 60(^{\circ})$ or $\widehat{ABC} = 60(^{\circ})$ or $\widehat{BAC} = 60(^{\circ})$ AND $\widehat{ACD} = 120(^{\circ})$ AND $\widehat{ADC} = 30(^{\circ})$	B2	Angles may be seen on diagram. B1 for any two of the three angles $30(^{\circ})$, $120(^{\circ})$ and $60(^{\circ})$
A correctly labelled and explained solution $\widehat{ACB} = 60(^{\circ})$ equilateral triangle $\widehat{ACD} = 120(^{\circ})$ angles on a straight line $\widehat{ADC} = 30(^{\circ})$ angles in an isosceles triangle (so $x = 150^{\circ}$) OR starting with the $150(^{\circ})$ $\widehat{ADC} = 30(^{\circ})$ angles on a straight line $\widehat{ACD} = 120(^{\circ})$ angles in an isosceles triangle $\widehat{ACB} = 60(^{\circ})$ so ABC is an equilateral triangle OR working from both side $\widehat{ACB} = 60(^{\circ})$ as an equilateral triangle $\widehat{ADC} = 30(^{\circ})$ angles on a straight line $\widehat{ACD} = 120(^{\circ})$ angles in an isosceles triangle AND $120 + 60 = 180$ angles on a straight line	E2	E2 and E1 dependent on B2 being awarded. Accept $\widehat{ACB} = 60(^{\circ})$ as all angles (in ABC) are equal/ 60° Accept $\widehat{ADC} = 30(^{\circ})$ as two angles (in ACD) are equal'
	(4)	E1 for either: - full explanations but incorrect labelling e.g. $C = 120(^{\circ})$ or $BDC = 120(^{\circ})$ - correct labelling but one explanation missing or incorrect

#4

Component 1: Foundation Tier	Mark	Comment
(a) $80 - 65$ or $180 - 100 - 65$ or $360 - (100 + 100 + 80 + 65)$ oe	M1	Check diagram. Answer line takes precedence. May be seen in stages
(w =) 15	A1	
(b) (x =) 70 $180 - 2 \times 70$ or $180 - 70 - x$	B1	Check diagram. Answer line takes precedence.
(y =) 40	M1	FT 'their x'.
	A1	May be seen in stages.
	(5)	

#5

Component 1: Foundation Tier	Mark	Comment
$(x =) \frac{360 - 290}{2} \text{ oe}$ $x = 35$ $y = 180 - (35 + 70) \text{ or } x + 70 = 180 - y$ $y = 75$	M2 A1 m1 A1	Check diagram M1 for $x + 75 + x + 70 + 85 + 60 = 360$ oe May be in stages e.g. $60 + 85 = 145$, $360 - 145 = 215$, $2x + 145 = 215$ Implied by 105 on the diagram. FT 'their derived 35' provided it is less than 110 and <u>M2</u> previously awarded. FT
	(5)	

Angles Properties: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	3	
#3	3	
#4	4	
#5	4	
#6	4	
#7	5	
#8	6	
Total	30	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(a) 135	B1	$\pm 2(^{\circ})$

#2

Component 2: Foundation Tier	Mark	Comment
(d)		
(x =) 113 ($^{\circ}$)	B1	
(y =) 360 – 54 – 67 – 142 or 360 – 263	M1	May be seen in stages
97 ($^{\circ}$)	A1	

#3

Component 2: Foundation Tier	Mark	
60° angle marked correctly on the diagram or indicated in working	B1	
360 – 90 – 90 – 60 (x =) 120 ($^{\circ}$)	M1 A1	FT 'their 60' providing < 180 CAO Unsupported 120 ($^{\circ}$) is awarded B1M1A1. <u>Note:</u> 360 ÷ 3 = 120 ($^{\circ}$) is an incorrect method and is awarded M0 A0.
	(3)	

#4

(a) (a =) 57 (b =) 46 (c =) 69	B1 B1 B2	B1 for 180 – (78+33) or equivalent
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#5

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a) (x =) 180 – 40 – 77 63($^{\circ}$)	M1 A1	
(b) (y =) 180 – 90 – 32 58($^{\circ}$)	M1 A1	
	(4)	

#6

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a) $360 - (69 + 58)$ 233	M1 A1	Or equivalent complete method.
(b) $180 - (96 + 37)$ 47	M1 A1	Or equivalent complete method.
	(4)	

#7

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
$5x + 40 = 6x + 20$ $x = 20$ $5 \times 20 + 40 + y + 35 = 180$ OR $6 \times 20 + 20 + y + 35 = 180$ OR $5 \times 20 + 40 + 2(y + 35) + 6 \times 20 + 20 = 360$ $y = 5$	M1 A1 M2 A1	Allow for $5 \times 20 + 40 = 6 \times 20 + 20$ which may be seen in stages FT 'their 20' for possible M2 provided previous M1 awarded. May be seen in stages. M1 for a correct equation $5x + 40 + y + 35 = 180$ or $6x + 20 + y + 35 = 180$ or $5x + 40 + y + 35 + 6x + 20 + y + 35 = 360$ CAO
<i>Alternative method (using simultaneous equations)</i> <i>Writes two correct equations in x and y</i> $5x + 40 + y + 35 = 180$ or $6x + 20 + y + 35 = 180$ or $5x + 40 + y + 35 + 6x + 20 + y + 35 = 360$ <i>Method to eliminate variable, e.g. equal coefficients and method to find second variable</i> <i>Finds the value of the first variable</i> <i>Second variable</i>	M2 m1 A1 A1	M1 for each correct equation May be simplified Allow one error in one term but not with equal coefficients CAO $x = 20$ OR $y = 5$ FT 'their first variable'
	(5)	

#8

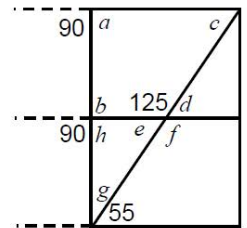
Component 2: Foundation Tier	Mark	Comment
(a) $a = 43 (^{\circ})$ $b = 62 (^{\circ})$ $c = 180 - (62 + 42)$ $= 76 (^{\circ})$	B1 B1 M1 A1	
(b) Isosceles	B1	
(c) $300 (^{\circ})$	B1	$\pm 2^{\circ}$
	(6)	

Angles on Parallel Lines: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	5	
#5	6	
Total	22	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(b) Valid combination of angles/reasons e.g. $a = 90$ angles on a straight line $b = 90$ vertically opposite $c = 55$ angles in a quadrilateral or Top is parallel to middle corresponding angles $d = 55$ angles on a straight line or $e = 55$ angles on a straight line	B2	NB Other valid reasons are possible, but reasons based on parallel lines must be justified. Longer methods must be complete for B2 B1 for two correct angles with at least one reason stated or for 3 correct relevant angles with no reasons stated and no incorrect angles seen or for showing the top is parallel to the middle or the middle is parallel to the bottom
and completion of argument e.g. '(Parallel as) alternate angles are equal.' or 'Middle is parallel to bottom corresponding angles (so top parallel to bottom).'	E1	 Do not accept 'F angles' or 'Z angles' as reasons.

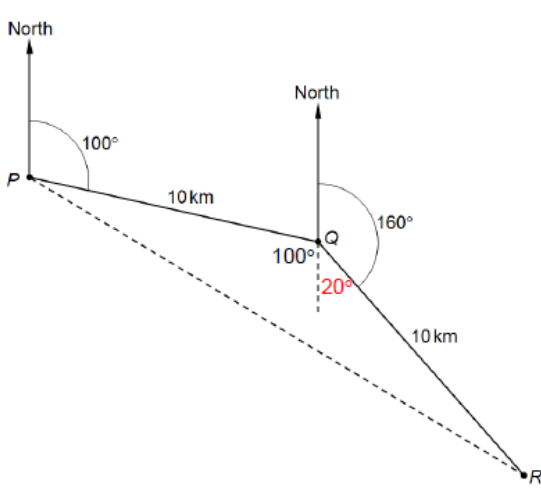
#2

Angle AEF or Angle $DEB = 93^\circ$ (Angles on a straight line (sum to 180)) Angle $AFE = 54^\circ$ (Corresponding angles (are equal)) or Angle $ABC = 93^\circ$ (Corresponding angles (are equal) or alternate angles (are equal)) ($x =$) $180^\circ - 93^\circ - 54^\circ = 33^\circ$ (Angles in a triangle (sum to 180)) A correct reason linked to a correct statement	B1 B1 B1 B1	Answers may be seen on the diagram; it must be clear from description or reasoning which angles are being calculated or used Alternative method for first 2 marks: Angle $BEF = 87^\circ$ (Vertically opposite angles (are equal)) Angle $ABC = 93^\circ$ (Interior angles (sum to 180)) or equivalent e.g. $93 + 33 + 54 = 180$ Alternative method 1: Assuming $x = 33^\circ$: Angle $ABC = 180^\circ - 33^\circ - 54^\circ = 93^\circ$ (Angles in a triangle (sum to 180)) B1 Angle AEF or Angle $DEB = 93^\circ$ (Angles on a straight line (sum to 180)) B1 Angle $ABC =$ Angle AEF (Corresponding angles (are equal)) or Angle $ABC =$ Angle DEB or (Alternate angles (are equal)) B1 A correct reason linked to a correct statement B1 Alternative method 2: Assuming $x = 33^\circ$: Angle $AFE = 54^\circ$ (Corresponding angles (are equal)) B1 Angle $AEF = 180^\circ - 33^\circ - 54^\circ = 93^\circ$ (Angles in a triangle (sum to 180)) B1 $93 + 87 = 180$ (Angles on a straight line (sum to 180)) B1 A correct reason linked to a correct statement B1 Alternative method 3: Angle $AFE = 54^\circ$ (Corresponding angles (are equal)) B1 $x + 54 = 87$ (Exterior angle (is equal to the sum of the two opposite interior angles)) B1 $x = 87 - 54 = 33$ B1 A correct reason linked to a correct statement B1
	(4)	

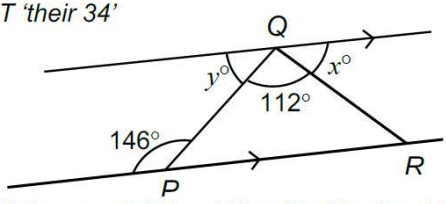
#3

TRS or $TSR = 40^\circ$ (Base angles of an isosceles triangle (are equal)) $PTQ = 40^\circ$ (Corresponding angles (are equal)) or $QTR = 40^\circ$ (Alternate angles (are equal)) and $PTQ = 40^\circ$ (Angles on a straight line (sum to 180)) $(x =) 90^\circ - 40^\circ = 50^\circ$ (QTU is a right angle) At least one correct reason stated appropriately	B1 B1 B1 E1	Answers may be seen on the diagram If values not marked on diagram, angle labels must be correct; allow $S = \dots$ or $R = \dots$ FT 'their TRS or TSR'; if values not marked on diagram, angle labels must be correct; do not allow $T = \dots$ CAO as answer given; must be convinced they are not working back from the given value and full and correct method must be shown <u>Alternative method:</u> <i>Draws the line of symmetry, TM, of triangle RTS and $MTS = 50^\circ$ (TM is a line of symmetry or triangles RTM and STM are congruent or equivalent)</i> $(x =) 50^\circ$ (Vertically) opposite angles
	(4)	B2 B2

#4

Component 1: Foundation Tier	Mark	Comment
(a) Valid explanation e.g. 'Alternate angles (between parallel lines)'	E1	Allow 'Alt' but not 'Alternative', not 'Alternating'; ignore correct embellishments such as Z angles; do not ignore incorrect embellishments E0 for e.g. 'It is congruent to angle P' without any justification
(b) $\widehat{PQR} = (100^\circ + 20^\circ) = 120^\circ$ (Angles on a straight line (sum to 180)) $\widehat{QPR} = 30^\circ$ (Base angles of an isosceles triangle (are equal)) (Bearing =) 130° At least one correct reason stated appropriately	B1 B1 E1	Angles may be seen on the diagram; degrees symbol may be omitted  FT 'their $\widehat{PQR}$ '
	(5)	

#5

(a) $\widehat{BFG}$ indicated as 94° or 104° OR $\widehat{CGF}$ indicated as 94° or 104° OR $\widehat{AFG}$ indicated as 76° or 86° and a correct value of another suitable angle indicated OR $\widehat{DGF}$ indicated as 76° or 86° and a correct value of another suitable angle indicated Clear and correct reasoning using correct angles e.g. $\widehat{BFG}$ or $\widehat{CGF}$ Corresponding angles should be equal or Vertically opposite angles should be equal $\widehat{CGF}$ and $\widehat{BFG}$ or $\widehat{AFG}$ and $\widehat{DGF}$ Alternate angles should be equal $\widehat{AFG}$ and $\widehat{CGH}$ or $\widehat{BFE}$ and $\widehat{BFG}$ or $\widehat{BFE}$ and $\widehat{DGF}$ or $\widehat{CGF}$ and $\widehat{CGH}$ Angles on a straight line should sum to 180	E1 E1	Any one of these, ignoring others; may be marked on diagram; if not marked on diagram must be correctly described e.g. using 3 letters or marking x on diagram and finding x in answer space dependent on the first mark; other forms of reasoning may be possible but the argument made must be complete and correct for the angles they have found. Allow e.g. 'No angles are corresponding' or 'They are not corresponding' or 'Corresponding angles are (not) equal' Allow e.g. 'Opposite angles are equal.' Allow e.g. 'Alt angles are the same.' Must be correct form of reasoning, do not allow F or Z angles or alternative angles Angles may be marked on the diagram
(b)(i) Complete correct method to find x, e.g. $146 - 112$ (alternate angles are equal) OR $(QPR =) 180 - 146 (= 34)$ (angles on a straight line) and $(QRP =) 180 - 112 - 34 (= 34)$ (angles in a triangle) 34° (alternate angles are equal) An appropriate reason linked to an angle Alternative method: $y = 180 - 146$ (allied angles) and $180 - 112 - 34$ (angles on a straight line) 34° An appropriate reason linked to an angle	M1 A1 E1 M1 A1 E1	FT 'their 34' for the second angle M0 for use of $180 - 112 = 68$, $68 \div 2 = 34$ CAO; 34° only is M0 A0 (one reason only is sufficient for this mark) Angles may be marked on the diagram FT 'their 34'  M0 for use of $180 - 112 = 68$, $68 \div 2 = 34$ CAO; 34° only is M0 A0 (one reason only is sufficient for this mark) Allow 'interior angles' or 'co-interior angles'
(b)(ii) Correct name and reason	B1 (6)	FT 'their (i)'; answer must be consistent with their values from part (i) EXCEPT allow a restart with correct calculations to show equal base angles If (i) correct 'Isosceles' and equal base angles or two equal angles oe stated or shown; may be seen in (i) e.g. on the diagram If (i) incorrect 'Scalene' and no equal angles oe stated or shown; may be seen in (i) e.g. on the diagram Reason referencing sides only is not sufficient; condone poor spelling if intention is clear

Angles on Parallel Lines: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	5	
Total	8	

Marking Scheme

#1

Component 2: Foundation Tier	Mark	Comment
(x =) 42	B1	
(y =) $(180 - 152) \div 2$	M1	
= 14	A1	
	(3)	

#2

(a)(i) $72(^{\circ})$	B1	
(a)(ii) $37(^{\circ})$	B1	
(a)(iii) $180 - (72 + 72)$ = $36(^{\circ})$	M1 A1	
(b) (Isosceles) Trapezium	B1 (5)	

Interior / Exterior Angles of Polygons: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

Marking Scheme

#1

Component 1: Foundation Tier	Mark	Comment
$180 - (360 \div 10)$ or $(180 \times (10 - 2)) \div 10$	M2	May be in stages M1 for one of the following: • $360 \div 10$ • $36(^{\circ})$ • $180 \times (10 - 2)$ • $1440(^{\circ})$
144($^{\circ}$)	A1	
	(3)	

Interior / Exterior Angles of Polygons: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
Total	4	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(Interior angle of the heptagon =) $180 - 360 \div 7$ OR $(7 - 2) \times 180 \div 7$ OR $(7 \times 180 - 360) \div 7$ $= 128.6(^{\circ})$ or $128.57(\dots)^{\circ}$ (Unique angle in triangle =) $(360 - 90 - 90 - 128.6) = 51.4(28\dots)^{\circ}$ Working to show that $x = 64.3$ to 1 d.p. $(180 - 51.4(28\dots)) \div 2 = 64.285$ to 64.3	M1 A1 B1 B1	May be seen on diagram. FT 'their derived 128.6' May be seen on diagram. CAO
<i>Alternative method 1 working from 64.3</i> (Unique angle in triangle =) $(180 - 64.3 - 64.3) = 51.4$ (Interior angle of the heptagon =) $(360 - 90 - 90 - 51.4) = 128.6$ (Interior angle of the heptagon =) $180 - (360 \div 7)$ OR $(7 - 2) \times 180 \div 7$ OR $(7 \times 180 - 360) \div 7$ $= 128.6(^{\circ})$ or $128.57(\dots)^{\circ}$	B1 B1 M1 A1	FT 'their $180 - 64.3 - 64.3$ ' Only awarded if this is clearly the interior angle of the heptagon
<i>Alternative method 1a for final 2 marks</i> (Sum of the interior angles of a heptagon =) $(7 - 2) \times 180$ o.e AND 128.6×7 900	M1 A1	M0 for 'their $128.6 \times 7 = 900(.2)$ alone Allow for 900 and 900.2
<i>Alternative method 2 using exterior angles</i> Exterior angle (of the heptagon) = $360 \div 7$ $= 51.4(28\dots)^{\circ}$	M1 A1	Method must be seen
(Unique angle in triangle =) $(360 - 90 - 90 - (180 - 51.4(28\dots)^{\circ}))$ $= 51.4(28\dots)^{\circ}$	B1	May be seen on diagram. FT 'their derived 51.4(28\dots)'
Working to show that $(x =) (180 - 51.4(28\dots)) \div 2 = 64.3$	B1	May be seen on diagram. CAO
	(4)	

Perimeter / Area / Volume: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	3	
#4	4	
#5	5	
#6	5	
Total	20	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a) 100 (cm ²)	B1	

#2

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
$2 \times 2 \times 18$ or $2 \times 3 \times 12$ or $2 \times 4 \times 9$ or $2 \times 6 \times 6$ or $3 \times 3 \times 8$ or $3 \times 4 \times 6$	B2	May be seen in any order. Accept any clear representation of correct dimensions. B1 for (volume of cubes = $64 + 8 =$) 72
	(2)	

#3

(a) $\frac{8 \times 21}{2}$ or equivalent	M1	
84 (cm ²)	A1	
(b) Valid explanation including 'perpendicular' or equivalent e.g. 'It is the perpendicular distance.' or 'Because the height makes a right angle with the base.'	E1	Allow e.g. 'Because it is at a right angle' or 'It's a perpendicular angle that splits directly through the middle.' or 'It is the height of the triangle' Do not allow 'Because it goes straight down not diagonally which would be longer' or 'Because it is a vertical line not a sloping one'
	(3)	

#4

Component 1: Foundation Tier	Mark	Comment
(a) 2 cm by 8 cm rectangle drawn	B2	Allow a good freehand for B2 or B1. B1 for one of the following: - a rectangle/square with a perimeter 20 cm - a rectangle/square with an area of 16 cm² - a rectangle drawn incorrectly but labelled as 2cm and 8cm. If more than one rectangle is drawn and no answer indicated then, as this is a choice, mark the worst.
(b)(i) 16 (cm)	B1	
(b)(ii) 1 : 2	B1	Must be fully simplified. FT 8 : 'their 16' provided this can be simplified.
	(4)	

#5

(a) $\frac{9 \times 52}{2}$ oe 234 (cm ²)	M1 A1	may be stages CAO; implies M1
(b) Correct use of line of symmetry: $2(AB + BC) = 20$ oe Correct use of proportion: $(4 \times) \frac{10}{5}$ or $5x = 10$ oe 8 (cm)	M1 M1 A1	si; allow $40 - 10 - 10 (= 20)$ or $\frac{40}{2} (= 20)$ or $10 + 10 + \dots + \dots = 40$ or $10 + 10 = 20$ or 2 improving trials on e.g. $AB + BC = 10$ CAO; implies M1 M1; may be on diagram
	(5)	

#6

Component 1: Foundation Tier	Mark	Comment
(Height at 11:00 =) 8 (cm)	B2	B1 for one of the following: • $20 - 4 \times (20 - 17)$ • $17 - 3 \times (20 - 17)$ • sight of (20,) 17, 14, 11, ...
(Volume at 11:00 =) $150 \times 8 \div 1000$	M1	FT 'their derived 8' provided at least B1 previously awarded.
1·2 litres	A2	A1 for 1200 (cm ³)
<u>Alternative method for the final 3 marks</u>		
(Volume at 11:00 =) $150 \times 20 \times \frac{8}{20}$	M1	FT 'their derived 8' proving at least B1 previously awarded.
1·2 litres	A2	A1 for 1200 (cm ³)
	(5)	

Perimeter / Area / Volume: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	2	
#4	2	
#5	3	
#6	3	
#7	3	
#8	3	
#9	4	
#10	4	
#11	4	
#12	5	
#13	6	
#14	6	
#15	6	
#16	6	
Total	60	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(b) Correct explanation Eg 'she needs to $\div 6$ first' 'she has done things in the wrong order' 'you need to square root the area of a face' ' $144 \div 6$ first'	B1	Do not allow e.g ' $\div 6$ ' ' $144 \div 6$ '

#2

Component 2: Foundation Tier	Mark	Comment
(a) 9×3 rectangle drawn	B1	
(b) 24(cm)	B1	FT 'their rectangle' drawn in (a) including a square.
	(2)	

#3

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(a) 12	B1	
(b) A rectangle with an area of 12 cm^2 e.g. 12×1 , 6×2 , 4×3	B1	FT 'their area' Allow a drawing of a square.
	(2)	

#4

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a)(i) Draws a rectangle with dimensions: 2 cm by 12 cm or 3 cm by 8 cm or 4 cm by 6 cm	B1	Allow good freehand
(a)(ii) 28 (cm) or 22 (cm) or 20 (cm)	B1	STRICT FT 'their rectangle' from part (i) but allow a correct perimeter from labelled lengths in (a)(i)

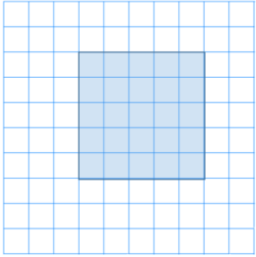
#5

Component 2: Foundation Tier	Mark	
(b) $7 \times 9.8 \times 16$ 1097.6 or 1098 (cm ³)	M2 A1	M1 for 7×9.8 (=68.6)

#6

(width =) $54 \div 12$ (=4.5) x 3 enlarged width = 13.5(cm)	M1 m1 A1 (3)	CAO
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#7

Component 2: Foundation Tier	Mark	Comment
(a) A square with 5cm sides 	B1	
(b)(i) 24(cm)	B1	
(b)(ii) A rectangle with sides 11×1 or 10×2 or 9×3 or 8×4 or 7×5	B1	Allow a square with 6 cm sides. FT their perimeter provided it's even. <u>Note:</u> Allow a square for FT answers. <u>Note:</u> Award the marks for a rectangle with a perimeter of 24cm even if it doesn't follow through (b)(i).
	(3)	

#8

(b) 18×6 or equivalent = 108(cm)	M1 A1	Check the diagram.
(c) $\frac{1}{30}$	B1	

#9

(a) Completes the table e.g. A (8 1) B 7 2 C 6 3 D 5 4	B2	Entries may be in a different order but the pairs must be correct (add up to 9). Award B1 for 2 correct pairs. Allow B1 for length and width in wrong order.
(b) identifies the 5 x 4 rectangle AND area is 20 (cm ²) with at least one other area correct.	B2 (4)	FT 'their greatest area' or associated letter, provided at least B1 awarded in (a). e.g. Area A = 8 (cm ²) Area B = 14 (cm ²) Area C = 18 (cm ²) Award B1 for identifying the correct rectangle or for sight of two correct areas

#10

(a) 11.8×3.2 = 37.76 = 40 (m ²)	M1 A2	If A2 not awarded, award A1 for 37.76(m ²)
(b) Indicates 'No' and explains e.g. 'needs 5 tins'	E1 (4)	Or equivalent explanations such as 'needs extra 0.4'

#11

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
$0.5 \times (3.9 + 4.6) \times 2.4$ or $(3.9 \times 2.4) + \frac{1}{2} \times (4.6 - 3.9) \times 2.4$	M1	For correct structure of formula;
10.2	A1	CAO
10.2×1.35 OR $14 \div 1.35$	M1	FT 'their derived 10.2'; must be derived from a dimensionally correct formula
(£)13.77 OR 10.3(7...)	A1	FT 'their derived 10.2×1.35 ' provided both M1's awarded and 'their answer' < 14
	(4)	

#12

Component 2: Foundation Tier	Mark	Comment
(volume =) $25 \times 40 \times 32$ = 32000 (cm ³)	M1 A1	May be seen in stages.
$32000 \div 2000$ OR $32 \div 2$	m2	FT 'their 32000' m1 for the appropriate division with a place value error from an incorrect conversion e.g. $32000 \div 200$ or $320 \div 2$. Allow m1 A0 for 'their $25 \times 40 \times 32 \div 2$ '.
16 (times)	A1	FT provided M1 m1 awarded
	(5)	

#13

(a) Sight of $6.5(\text{cm}) \pm 0.2(\text{cm})$ or $65(\text{mm}) \pm 2(\text{mm})$ 6.5×6.5 $= 42.25 \text{ (cm}^2\text{)}$ $42.25 = \text{length} \times 5$ $42.25 \div 5$ 8.45 (cm)	B1 M1 A1 B1 M1 A1	FT 'their 6.5'. Do not accept different '6.5's'. FT 'their 42.25'. If no marks awarded, award SC1 for 'their area $\div 5$ evaluated correctly'.
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#14

(a) 10x2.6 OR 14x2.6 or equivalent (perimeter of shape 1 =) 26(cm) (perimeter of shape 2 =) 36.4(cm)	M1 A1 A1	If no marks, award SC1 for perimeter answers of 10(cm) AND 14(cm). Accept any reasonable attempt at a 3x3 square.
(b) (i) Sketches a 3x3 square (ii) 9×2.6^2 or $(3 \times 2.6)^2$ 60.84(cm ²)	B1 M1 A1 (6)	

#15

Component 2: Foundation Tier	Mark	Comment
(a) (Cost =) $8.5 \times 5.5 \times 12.48$ $= (\pounds) 583.44$	M2 A1	May be seen in stages M1 for $8.5 \times 5.5 (= 46.75 \text{ m}^2)$
(b) $67.2 \div 10.5$ 7 (rolls)	M1 A2	A1 for 6.4
<u>Alternative method</u> <i>At least two improving trials using values between 5 and 9 rolls inclusive</i> 7 (rolls)	M1 A2	<i>Note: must see answers to their trials or states too small or too big</i> <i>A1 for trials for 6 and 7 rolls with areas 63 and 73.5 (or correct evaluations for trials between 6 and 7 rolls provided one gives an answer < 67.2 and one > 67.2)</i>
	(6)	

#16

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(a) $(63.75 - 3) \div 1.35$ $= 45$	M1 A1	May be seen in stages Allow an embedded answer unless contradicted. If no marks, award SC1 for an answer of 61.5(27...) (from $63.75 - 3 \div 1.35$)
(b) $2 \times 35.6 \times 4$ or 284.8 (cm) or $2 \times 0.356 \times 4$ or 2.848 (m) $400 - (2 \times) 35.6 \times 4$ or $4 - (2 \times) 0.356 \times 4$ $= 115.2$ (cm) or $= 1.152$ (m)	M2 m1 A1	Answer line take precedence. May be seen in stages. M1 for either of: • 35.6×4 or 142.4 (cm) • 0.356×4 or 1.424 (m) FT from M2 or M1 CAO but allow 115 (cm) or 1.15 (m) from correct working. If units are given, they must be correct.
<u>Alternative method</u> $\frac{(400 - 35.6 \times 4) \times 2}{2}$ or $\frac{(4 - 0.356 \times 4) \times 2}{2}$ oe $= 115.2$ (cm) or $= 1.152$ (m)	M3 A1	May be seen in stages. M2 for either of: • $\frac{400}{2} - 35.6 \times 4$ or 57.6 (cm) • $\frac{4}{2} - 0.356 \times 4$ or 0.576 (m) M1 for either of: • 35.6×4 or 142.4 (cm) • 0.356×4 or 1.424 (m) CAO but allow 115 (cm) or 1.15 (m) from correct working. If units are given, they must be correct.

Geometrical Problems on Coordinate Axes: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	4	
Total	8	

Marking Scheme

#1

(a)(i) (3, 4)	B1	
(a)(ii) C marked at $(-1, 1)$	B1	Allow unambiguous mark at $(-1, 1)$
(b) D marked at $(-5, 4)$ and 8 cm	B2	B1 for D correctly marked or B1 STRICT FT for 'their length AD'; $\pm 2\text{mm}$ Allow unambiguous mark at $(-5, 4)$
	(4)	

#2

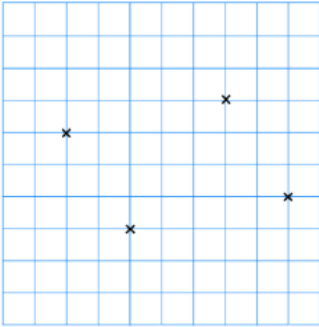
(a) Point marked at $(-4, 3)$	B1	
(b) $(-4, 3)$	B1	FT their plotted point
(c) 32 cm	B2	B1 for either
	(4)	

Geometrical Problems on Coordinate Axes: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	4	
#3	4	
Total	9	

Marking Scheme

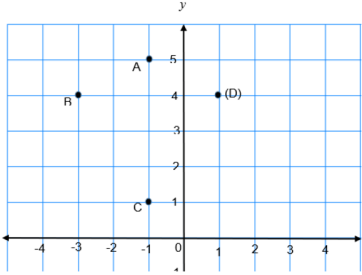
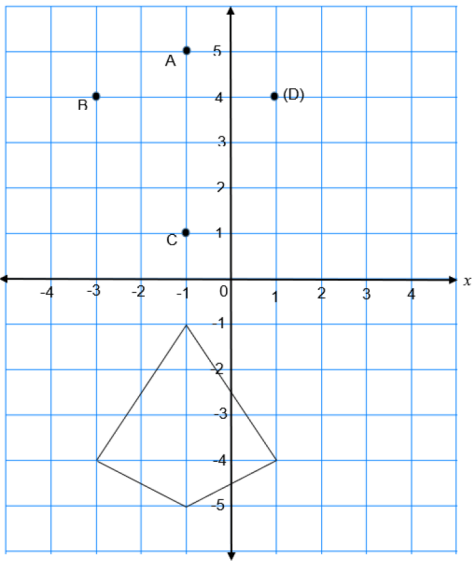
#1

Component 2: Foundation Tier	Mark	Comment
(b) Correct vertex 	B1	

#2

(a) H correctly positioned on the diagram (3, 2)	B1	
	B1	FT 'their H'
(b) J correctly positioned on the diagram (-2, 6)	B1	
	B1	FT 'their J', provided at least one negative coordinate.
	(4)	

#3

Component 2: Foundation Tier	Mark	Comment
(a) D plotted at (1,4) 	B1	
(b) (1 , 4)	B1	FT 'their D'
(c) Correct reflection in the x axis. 	B2	FT their ABCD for B2 or B1. Allow B2 for the reflection of the 4 correct points not joined. B1 for a reflection with 3 correct points. B1 for a correct reflection in the y axis.
	(4)	

Constructions Using Ruler / Compass / Protractor: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	5	
Total	9	

Marking Scheme

#1

Eduqas Autumn 2019 C2 Foundation Tier		Comments
(b) Draws an accurate triangle, with angle $BAC = 90^\circ \pm 2^\circ$ and line $AC = 6.5\text{cm} \pm 0.2\text{cm}$	B2	The triangle must be 'closed' to gain B2. Candidates are not expected to use compasses. Award B1 if one error, e.g. line or angle out of tolerance or BC not drawn.

#2

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(b) $ABC = 75^\circ$ $BC = 6.4\text{ cm}$	B1 B1	$\pm 2^\circ$ $\pm 0.2\text{ cm}$ If B2 is awarded then penalise -1 if the triangle is incomplete. If B2 is awarded but the line AB has been redrawn incorrectly then penalise -1.

#3

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
Correct perpendicular bisector construction with appropriate arcs	B2	B1 for perpendicular bisector within tolerance ($\pm 2^\circ$) without arcs or with invalid arcs or for a correct pair of arcs that intersect twice.
Correct angle bisector construction of XOY with appropriate arcs	B2	B1 for angle bisector within tolerance ($\pm 2^\circ$) without arcs or with invalid arcs or for a correct pair of arcs
Correct point indicated	B1	FT provided at least B1, B1 awarded; may be implied by intersecting loci
	(5)	

Plans & Elevations: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	3	
#3	3	
Total	7	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(b) cone indicated	B1	

#2

(a)(i) B indicated	B1	
(a)(ii) 3 indicated	B1	
(b) sphere indicated	B1	
	(3)	

#3

For the plan: draws a circle, radius 3 cm and for the side elevation: draws a 4 cm by 6 cm rectangle	B3	Circle must be drawn with compasses and rectangle must be ruled. B2 for either the plan or elevation correct or for good freehand sketches of both the correct circle and the correct rectangle or B1 for a circular plan with incorrect radius or for a rectangular side elevation with incorrect dimensions or for a good freehand circle for the plan or a good freehand rectangle for the elevation; may also have incorrect dimensions
	(3)	

Similarity & Congruency: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	2	
#3	4	
#4	6	
Total	13	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(b) Correct ruled right-angled triangle with short sides of 3 cm and 8 cm	B1	Mark intent

#2

(a) $\frac{4}{9}$ or an equivalent fraction	B1	
(b) 2 : 3 or equivalent	B1	
	(2)	

#3

$(BC =) 5$ $12^2 + 5^2 (= 169)$ $x^2 = 169$ or $x = \sqrt{169}$ $(x =) 13$	B1 M1 A1 A1	FT 'their 5' FT 'their 5' FT from M1, if possible, for the correctly evaluated square root of 'their 169' provided 'their answer' > 12. Accept an unsupported 13 (cm) If no marks award SC1 for sight of $AC = \frac{1}{2} \times PR$ or equivalent <u>Alternative method:</u> $24^2 + 10^2 (= 676)$ M1 $x^2 = 676$ or $x = \sqrt{676}$ A1 $(PR =) 26$ A1 $(x =) 13$ B1
	(4)	

#4

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment												
(a) <table border="1" data-bbox="296 241 767 427"> <tr> <td>True</td><td>False</td><td>Need more information</td></tr> <tr> <td></td><td></td><td>✓</td></tr> <tr> <td>✓</td><td></td><td></td></tr> <tr> <td></td><td>✓</td><td></td></tr> </table>	True	False	Need more information			✓	✓				✓		B2	For all three correct B1 for any two correct
True	False	Need more information												
		✓												
✓														
	✓													
(b) Yes indicated or clearly implied (with indication of one 120° angle) with two 30° angles.	B2	B1 for a clear indication of interior angle of 120°												
(c) $(\frac{10}{7.5} = \frac{12}{9} = \frac{8}{6})$ same scale factor = $\frac{4}{3}$ oe OR $(\frac{7.5}{10} = \frac{9}{12} = \frac{6}{8})$ same scale factor = $\frac{3}{4}$ oe	B2	B1 just for $\frac{10}{7.5} = \frac{12}{9} = \frac{8}{6}$ OR $\frac{7.5}{10} = \frac{9}{12} = \frac{6}{8}$ Award no marks if the ratios of less than three pairs of sides compared.												
<u>Alternative method 1</u> 12:10:8 and 9:7.5:6 both simplify to 6:5:4 oe OR both equivalent to 108:90:72 oe	B2	B1 for stating 12:10:8 = 9:7.5:6 without simplifying to 6:5:4												
<u>Alternative method 2</u> B2 for any one of the following: $7.5 \times \frac{12}{9} = 10$ AND $6 \times \frac{12}{9} = 8$ $10 \div \frac{12}{9} = 7.5$ AND $8 \div \frac{12}{9} = 6$ $9 \times \frac{10}{7.5} = 12$ AND $6 \times \frac{10}{7.5} = 8$ $12 \div \frac{10}{7.5} = 9$ AND $8 \div \frac{10}{7.5} = 6$ $9 \times \frac{8}{6} = 12$ AND $7.5 \times \frac{8}{6} = 10$ $12 \div \frac{8}{6} = 9$ AND $10 \div \frac{8}{6} = 7.5$	B2	B1 for any one of the following: $7.5 \times \frac{12}{9} = 10$ OR $6 \times \frac{12}{9} = 8$ $10 \div \frac{12}{9} = 7.5$ OR $8 \div \frac{12}{9} = 6$ $9 \times \frac{10}{7.5} = 12$ OR $6 \times \frac{10}{7.5} = 8$ $12 \div \frac{10}{7.5} = 9$ OR $8 \div \frac{10}{7.5} = 6$ $9 \times \frac{8}{6} = 12$ OR $7.5 \times \frac{8}{6} = 10$ $12 \div \frac{8}{6} = 9$ OR $10 \div \frac{8}{6} = 7.5$												
	(6)													

Converting Units: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
Total	1	

Marking Scheme

#1

(b)	8	B1	
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Converting Units: Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
#2	1	
#3	3	
#4	4	
#5	6	
Total	15	

Marking Scheme

#1

. Explanation, e.g. '1m ² = 10 000cm ² ', 'as this is area not length', '1m ² is 100cm by 100cm'	E1 (1)	Accept a diagram showing 1m by 1m is 100cm by 100cm
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#2

Component 2: Foundation Tier	Mark	Comment
(a) 7 000 000 indicated	B1	
(b) $\frac{1}{2} \times (79 + 62) \times 30$ oe $\pi(30 \div 2)^2$ $(\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2) \div (\pi \times 15^2)$ OR $\frac{1}{2} \times (79 + 62) \times 30 \div (\pi \times 15^2) - 1$ $(k =) 1.9(921\dots)$ si $(k =) 2$	B1 B1 M2 A1 B1	(= 2115) (= 706.858...) dep on at least B1 awarded; FT 'their area of circle' or 'their area of trapezium' for M2 or M1 (= $(2115 - 225\pi) \div 225\pi$) Award M1 for one of the following: • $\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1...) • $\frac{1}{2} \times (79 + 62) \times 30 \div (\pi \times 15^2)$. (= 2.99...) • $(706.9 : 2115 =) 1 : 2.9(9\dots)$ or $1 : 3$ CAO FT 'their 1.99...' rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of $(k =) 2$ implies the previous A1 if no incorrect working seen e.g. $706.9 : 1408.1 = 1 : 2$ <i>Note: unsupported answers of 1:2 or $k = 2$ or are awarded zero marks</i>
	(7)	

#3

(a) (i) 3500 (grams)	B1	CAO
(a) (ii) 3500 : 475 or 3.5 : 0.475 = 140 : 19	M1 A1	For conversion to same units on both sides of the ratio. FT 'their 3500' for M1. CAO
(b) 2440 $\div$ 8 $\times$ 5 OR 2440 $\div$ 8 $\times$ 3 1525 OR 915 (2440 – 1525 =) 915 AND (2440 – 915 =) 1525 Mass of Strawberries 1525 (g) Mass of Raspberries 915 (g)	M1 A1 B1 (6)	B1 awarded if the sum of their answers is 2440, provided M1 awarded.

#4

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
(a) $(63.75 - 3) \div 1.35$ $= 45$	M1 A1	May be seen in stages Allow an embedded answer unless contradicted. If no marks, award SC1 for an answer of 61.5(27...) (from $63.75 - 3 \div 1.35$)
(b) $2 \times 35.6 \times 4$ or 284.8 (cm) or $2 \times 0.356 \times 4$ or 2.848 (m) $400 - (2 \times) 35.6 \times 4$ or $4 - (2 \times) 0.356 \times 4$ $= 115.2$ (cm) or $= 1.152$ (m)	M2 m1 A1	Answer line take precedence. May be seen in stages. M1 for either of: • 35.6×4 or 142.4 (cm) • 0.356×4 or 1.424 (m) FT from M2 or M1 CAO but allow 115 (cm) or 1.15 (m) from correct working. If units are given, they must be correct.
<u>Alternative method</u> $\frac{(400 - 35.6 \times 4) \times 2}{2}$ or $\frac{(4 - 0.356 \times 4) \times 2}{2}$ oe $= 115.2$ (cm) or $= 1.152$ (m)	M3 A1	May be seen in stages. M2 for either of: • $\frac{400}{2} - 35.6 \times 4$ or 57.6 (cm) • $\frac{4}{2} - 0.356 \times 4$ or 0.576 (m) M1 for either of: • 35.6×4 or 142.4 (cm) • 0.356×4 or 1.424 (m) CAO but allow 115 (cm) or 1.15 (m) from correct working. If units are given, they must be correct.
(c)(i) $595(.35)$ (g)	B2	B1 for one of the following: • 7×28.35 • $198(.45)$ • $7 \times 3 \times 28.35$ • 21×28.35
(c)(ii) 18 (ounces)	B2	B1 for either of: • $17.6(36....)$ • $500 \div 28.35$ oe
	(10)	

#5

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a) $30 \div 1.6$ 18.75 (miles per second)	M1 A1	Do not ISW but award M1A0 if $30 \div 1.6$ or 18.75 are seen with further incorrect work.
(b)(i) 1.6×1.6 or 1.6^2 2.56 (km ²)	M1 A1	
(b)(ii) 512 million or 512 000 000	B2	FT their answer to (b)(i) and award: B2 for the correct evaluation of $200\,000\,000 \times \text{'their 2.56'}$ <i>For example, with an answer of 4 in (i) award B2 for 800 000 000 or 800 million</i> B1 for the correct evaluation of $20\,000\,000 \times \text{'their 2.56'}$ OR $2\,000\,000\,000 \times \text{'their 2.56'}$ (a place value error of a power of 10 only)
	(6)	

Bearings / Scale Diagrams: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	5	
#5	8	
#6	9	
Total	33	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
Position of X 150° from Y .	B1	$\pm 2^\circ$
Position of X 8 cm from Y .	B1	$\pm 2\text{mm}$
Correct three-figure bearing given.	B1	FT 'their X ' position $\pm 2^\circ$ provided at least B1 previously awarded.
	(3)	

#2

(a) $258^\circ \pm 2^\circ$	B1	
(b) Arc centre A radius $5\text{ cm} \pm 2\text{ mm}$ Arc centre B radius $6\text{ cm} \pm 2\text{ mm}$	B1 B1	Use overlay If no arcs shown, but single point indicated as C , then allow either or both of the first 2 marks if it satisfies one or both criteria; may be below AB If two points are drawn, each of which satisfies only one condition, then no marks
Position of C unambiguously identified	B1	FT 'their $5\text{ cm} \pm 2\text{ mm}$ from A ' OR 'their $6\text{ cm} \pm 2\text{ mm}$ from B ' provided at least B1 already awarded; must be above AB
	(4)	

#3

Component 1: Foundation Tier	Mark	Comment
Kit's position found correctly: 6 cm from S bearing 160° from S	B2	Tolerances: $\pm 2\text{ mm}$, $\pm 2^\circ$ B1 for a correct distance or bearing
Correct distance from T Correct bearing from T	B2	Tolerances: $\pm 4\text{ m}$, $\pm 2^\circ$ FT 'their position of Kit'; if correct position of Kit, 150 m and 200° . B1 for either a correct distance or correct bearing
	(4)	

#4

(a) 1.5 (km)	B2	B1 for 7 – 4 si or 3 cm or for sight of 3.5 km or 2 km Tolerance ± 2 mm on measurements
(b) $145 \pm 2^\circ$	B1	
(c) Correct point marked: 5 cm $\pm$ 2 mm from <i>R</i> and on a bearing of $225^\circ \pm 2^\circ$ from <i>Q</i>	B2	B1 for an arc, centre <i>R</i> , radius 5 cm $\pm$ 2 mm or a point which is either 5 cm $\pm$ 2 mm from <i>R</i> or on a bearing of $225^\circ \pm 2^\circ$ from <i>Q</i>
	(5)	

#5

(a) Indication of bearing $135^\circ \pm 2^\circ$ from <i>L</i> Indication of bearing $064^\circ \pm 2^\circ$ from <i>P</i> Position of the boat marked	B1 B1 B1	Position may be implied by intersection of straight lines for bearings
(b)(i) $6 \times 10 \div 5$ 12 (litres)	M2 A1	Or equivalent full method STRICT FT 'their position of the boat', so 'their 6' $\times 10 \div 5$ Tolerance ± 2 mm M1 for 'their 6' in cm $\times 10$ or 'their 6' in mm $\times 10 \div 5$ FT; must follow correct use of 'their 6' in cm If there is no 'position of the boat' marked in (a) allow SC2 for 'a number of litres' correctly found from 'a length in cm' $\times 10 \div 5$ or SC1 for 'a length in cm' $\times 10 \div 5$
(b)(ii) Valid assumption about the conditions or straight line of the journey e.g. 'The conditions were normal so the boat travelled 5km per litre.' or 'The weather was normal.' or 'The sea was normal.' or 'The weather conditions were unusually good.' or 'The boat travelled in a straight line to H.' Valid impact based on their assumption e.g. 'The boat would use more fuel.' or 'The boat would use less fuel.' or 'The amount of fuel used to travel 5 km would be different, so the total amount needed would be different.'	E1 E1	
	(8)	

#6

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a)(i) Indication of bearing $015^\circ \pm 2^\circ$ from <i>C</i>	B1	Position may be implied by intersection of straight lines for bearings
Indication of bearing $320^\circ \pm 2^\circ$ from <i>F</i>	B1	
Both bearings correct and position of Don's house indicated	B1	
(a)(ii) 8000 (m) oe	B2	STRICT FT 'their <i>DB</i> in cm' $\times 1000$ Tolerance $\pm 2\text{mm}$; B1 STRICT FT for 'their <i>DB</i> in cm' or for a correct evaluation of ' <i>their DB</i> measured to $\pm 5\text{mm}$ ' $\times 1000$
(b) (Working time =) 6 hours si 9 trips (in 6 hours) si or 48 people in 2 hours si 9×16 or $48 + 48 + 48$ oe	B1 B1 M1	May be implied by e.g. 3 lots of 2 hrs from 10 am to 4pm FT 'their derived $9' \times 16$ si or '(their 3×16 ') $\times$ ('their derived $6' \div 2$) si or '(their 3×16 ') $\times$ ('their sets of 3 trips' in a day) si if correct, implies B1 B1; M1 is not implied by a wrong value without method seen
144	A1 (9)	CAO

Bearings / Scale Diagrams: Calculator

Question	Maximum Mark	Mark Awarded
#1	4	
#2	5	
Total	9	

#1

#2

229

Transformations: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
Total	7	

Marking Scheme

#1

(a) Correct shape drawn at (2, 2) (2, 4) (4, 4) (6, 2)	B2	B1 for a rotation of 90° anti-clockwise about (0, 0) or for 3 out of 4 points plotted correctly and joined
(b) Point <i>P</i> marked at (9, -2)	B1	Allow unlabelled if unambiguous
	(3)	

#2

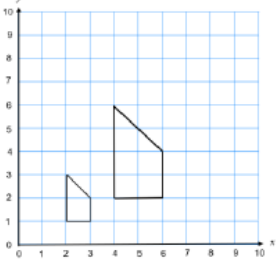
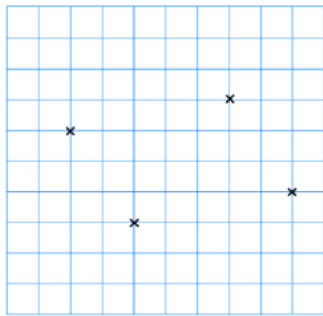
Component 1: Foundation Tier	Mark	Comment
(a) Correct triangle with coordinates: (-1, 4), (-6, 3), (-3, 1)	B2	B1 for: 3 points correctly plotted but not joined, - a triangle with 2 points correctly plotted, - a correct reflection in $y = k$, $k \neq 4$.
(b) Correct triangle with coordinates (5, 4), (0, 5), (3, 7)	B2	B1 for: 3 points correctly plotted but not joined, - a triangle with 2 points correctly plotted, - a translation $\begin{pmatrix} 6 \\ m \end{pmatrix}$, $m \neq 0$, - a translation $\begin{pmatrix} n \\ 0 \end{pmatrix}$, $n \neq 6$, - a translation $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$. Treat translation of triangle <i>B</i> as a misread and award B1 for (5, 4) (0, 3) (3, 1). FT 'their triangle <i>B</i>'.
	(4)	

Transformations: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	4	
#5	6	
Total	21	

Marking Scheme

#1

Component 2: Foundation Tier	Mark	Comment
(a) The correct shape in the correct position. 	B3	Allow a good freehand drawing. B2 for a correct enlargement in an incorrect position OR for four correct points plotted but not joined. B1 for two correct sides in the correct position OR three correct points plotted but not joined. If no marks allow SC1 for showing at least three correct 'rays' from (0,0). Treat consistent use of a different scale factor ($\neq 1$) as a misread.
(b) Correct vertex 	B1	
	(4)	

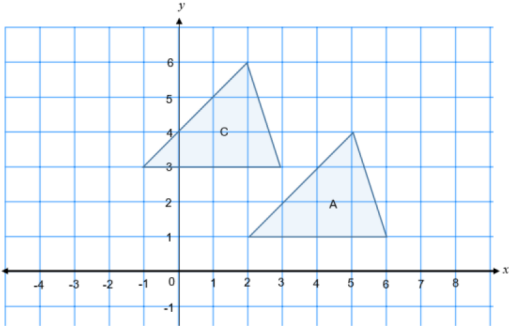
#2

(a) Translation 3 right and 2 down or $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$	B1 B1	Do not accept 3 across and 2 down.
(b) Correct reflection on the grid.	B2	B1 for a correct reflection but in a different horizontal mirror line or in the line $x = 4$ or sight of the line $y = 4$.
	(4)	

#3

Component 2: Foundation Tier	Mark	
(a) Correct translation i.e. 3 squares to the right and 4 down Vertices (4, -3) (0, -2) (1, -4)	B2	B1 for a correct horizontal or vertical translation
(b) Correct rotation Vertices (1, 3) (1, 4) (4, 4) (4, 2) (3, 2) (3, 3)	B2	B1 for a 90° anticlockwise rotation about (0,0)
	(4)	

#4

Component 2: Foundation Tier	Mark	Comment
(a) All three elements correct: • rotation • 90° clockwise or 270° anticlockwise • about the origin or (0,0).	B2	B1 for one of the following: • Rotation 90° • Rotation 270° • Rotation about the origin or (0,0) • 90° clockwise about the origin or (0,0) • 270° anticlockwise about the origin or (0,0) <i>Note: Allow the origin to be written as 0,0 without brackets but not as 0.</i>
(b) Correct translation i.e. 3 squares to the left and 2 up 	B2	B1 for a correct horizontal or vertical translation <i>Note: mark a correct translation of triangle B as a mis-read.</i>
	(4)	

#5

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a)(i) $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$	B2	B1 for sight of $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ Allow B1 for $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ written incorrectly e.g. $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$
(a)(ii) Correct shape <i>B</i> drawn at (2, 1), (2, 4), (3, 4), (3, 2), (4, 2), (4, 1),	B2	or correct FT; FT 'their $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ '; B1 for a translation attempted with at least 4 vertices correct or shape <i>A</i> correctly translated by $\begin{pmatrix} 6 \\ y \end{pmatrix}$ where $y \neq -1$ or $\begin{pmatrix} x \\ -1 \end{pmatrix}$ where $x \neq 6$ If no marks in (a) then award SC1 for a clear attempt to translate by $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$.
(b) Reflection (in the line) $y = x$	B2	B1 for either stating a reflection or giving the equation $y = x$ Award no marks if more than one transformation indicated If no marks then award SC1 for a correct diagram with the line $y = x$ drawn.
	(6)	

Properties of a Circle: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	4	
#3	4	
#4	6	
Total	17	

Marking Scheme

#1

Any valid reason e.g. 'Nia has found the circumference.' or 'Circumference circle = $\pi \times 24$.' or 'She has used the diameter, not the radius squared'. or 'Area circle = $\pi \times 144$' $\left(\frac{\pi \times 144}{8}\right) = 18\pi \text{ (cm}^2\text{)}$	E1	Allow e.g. 'Area of circle <u>should be</u> $\pi \times r^2$' or 'Area circle = $\pi \times 12^2$.' Do not allow e.g. 'Area circle = $\pi \times r^2$ and Circumference = $\pi \times d$ or Area = $\pi \times r^2$ without further evidence e.g. correct method shown
	B2	Mark final answer B1 for (area sector =) $\frac{\pi \times 12^2}{8}$ or equivalent; Allow use of $\pi = 3.14$ for E1 and B1
	(3)	

#2

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
(a) 2	B1	
(b) $\pi \times 6^2 - \pi \times 5^2$ or $36\pi - 25\pi$ si 11 π	M2 A1	For M2 or M1, π could be 3.14 or better or $\frac{22}{7}$ etc M1 for sight of $\pi \times 6^2$ or $\pi \times 5^2$ oe Mark final answer; not from wrong working; allow $\pi \times 11$ or $11 \times \pi$ but do not allow $\pi 11$ If no marks, award SC1 for an answer of 44π or $\pi \times 44$ or $44 \times \pi$ (from $\pi \times 12^2 - \pi \times 10^2$)
	4	

#3

Component 1: Foundation Tier	Mark	Comment
(Area of shape =) $2 \times \pi \times 6^2$ OR $4 \times \frac{\pi \times 6^2}{2}$ $+ 12^2$ $= 144 + 72\pi \text{ (cm}^2\text{)}$	M2 m1 A1	M1 for $\pi \times 6^2$ or $\frac{\pi \times 6^2}{2}$ FT from M2 or M1. CAO
	(4)	

#4

GCSE (9-1) Mathematics Component 1: Foundation Tier		Mark	Comment
(a)	6	B1	
(b)	Yes with valid explanation e.g. 'because $52\text{cm} \times 2 = 104\text{ cm}$ ' or 'the diameter will be $104\text{ cm} = 1.04\text{ m}$ ' or 'the diameter is more than 100.'	B1	
(c)(i)	Use of 12 or 10 bags Suitable calculation e.g. $(£)7[.00] \times 12$ or $(£)7.2[0] \times 12$ or $(£)7[.00] \times 10$ or $(£)7.2[0] \times 10$ or $(£)7.19 \times 10$ Correct evaluation e.g. $(£)84[.00]$ or $(£)86.4[0]$ or $(£)70[.00]$ or $(£)72[.00]$ or $(£)71.9[0]$	M1 M1 A1	or equivalent; allow $(£)7.5[0] \times 12$ or $(£)7.5[0] \times 10$ or a less accurate rounding e.g. $(£)10 \times 12$ or $(£)10 \times 10$ Method must be shown; allow $(£)90[.00]$ or $(£)75.00$ If first M0, allow M1 for $(£)7[.00] \times 18$ or $(£)7[.00] \times 20$ or $(£)7.2[0] \times 18$ or $(£)7.2[0] \times 20$ or $(£)7.19 \times 20$ or $(£)7.5[0] \times 18$ or $(£)7.5[0] \times 20$ or equivalent or for a less accurate rounding e.g. 10×20 and A1 for correct evaluation e.g. $(£)126[.00]$ or $(£)140[.00]$ or $(£)129.6[0]$ or $(£)144[.00]$ or $(£)143.80$ or $(£)135[.00]$ or $(£)150[.00]$ If M1 M0, allow SC1 for $[12 \times 7.19 =] £86.28$ rounded to $£86[.00]$ or $£90[.00]$
(c)(ii)	Appropriate answer e.g. 'Under-estimate as I rounded down.'	E1	Dependent on their calculation for (c)(i); cannot be awarded if (c)(i) is not attempted. NB compare with $£86.28$
		(6)	

Properties of a Circle: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	2	
#3	4	
#4	4	
#5	4	
#6	5	
#7	5	
#8	5	
#9	5	
#10	6	
Total	42	

Marking Scheme

#1

(a) $(C =) 2 \times \pi \times 14$ or $\pi \times 28$ Answer in the range 87.9 to 88 (cm) or 28π (cm)	M1 A1	
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#2

Eduqas Autumn 2019 C2 Foundation Tier		Comments
(a)(i) Radius (ii) Chord (iii) Parallel	B2	B2 for all three correct B1 for any two correct

#3

(b) Diameter indicated	B1	
(c) $72 + 98 + 56 + 87 + 47 = 360$ Identifying 85° .	M2 A1	Award M1 for $72 + 98 + 56 (=226)$ + two of 85 or 87 or 47. Implied by sight of 358 or 398 or 134 <i>Alternative method 1:</i> $72 + 98 + 56 + 85 + 87 + 47 - 360$ M2 = 85 A1 <i>Alternative method 2:</i> $445 - 360$ M2 = 85 A1 <i>Sight of '445' and correct answer will be M2A1</i>

#4

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(radius =) $\frac{40.841}{2\pi}$ (= 6.50...)	B2	B1 for $2\pi r = 40.841$ or $\pi d = 40.841$ or $\frac{40.841}{\pi}$ or 13.0
(Area =) $\pi \times \left(\frac{40.841}{2\pi}\right)^2$ (= $\pi \times 6.5^2$) 132.7(...) or 133 (cm ²)	M1 A1 (4)	FT 'their derived radius' CAO; correct answer implies all previous marks

#5

Component 2: Foundation Tier	Mark	
(a) $8.2^2 - \pi \times \left(\frac{8.2}{2}\right)^2$ oe 14.4 or 14.42 to 14.46 (cm ²)	M3 A1	M2 for sight of (area of circle =) $\pi \times \left(\frac{8.2}{2}\right)^2$ (= 52.81....) oe or M1 for sight of (area of square =) 8.2^2 (= 67.24) AND for (radius of circle =) 4.1 (look on diagram) May be embedded in an incorrect calculation Accept 14 only if from correct working

#6

Component 2: Foundation Tier	Mark	Comment
(a) 40 (circles)	B1	
(b) $60 \times 96 - 40 \times \pi \times 6^2$ Answer in the range 1235.5 to 1238.4 (cm ²)	M3 A1	May be seen in stages. FT their 40 provided between 6 and 50 inclusive. M2 for $40 \times \pi \times 6^2$ M1 for $60 \times 96 - k\pi$ or sight of $\pi \times 6^2$ or 113(.09..) CAO. <i>If no marks, allow M1 for sight of $\pi \times 6^2$ or 113(.09..) seen in (a) or by the diagram.</i>
	(5)	

#7

Component 2: Foundation Tier	Mark	Comment
Method for finding the area of either circle $\pi \times 3^2$ or $\pi \times 5^2$	S1	Sight of 28.2(74....) or 78.5(39....) imply S1
(Area of Amy's slice =) $\frac{1}{2} \times \pi \times 3^2$ o.e	M1	
(Area of Vance's slice =) $\frac{1}{4} \times \pi \times 5^2$ o.e	M1	
Vance indicated and both areas correct. (Amy) 14.1(37..) or $\frac{9}{2}\pi$ or 4.5π (inches ²) (Vance) 19.6(349..) $\frac{25}{4}\pi$ or 6.25π (inches ²)	A2	If A2 not awarded award A1 for either area correct.
	(5)	

#8

Component 2: Foundation Tier	Mark	Comment
(a) $\frac{42}{60} \times 360$ or 42×6 or 360×0.7 oe 252(°)	M2 A1	M1 for appropriate sight of $\frac{42}{60}$ or 0.7 oe or $42 \times 360 (= 15\,120)$ CAO
(b)(i) A valid assumption e.g. 'The wheel spins at a constant speed.' or 'The wheel is spinning at the same rate all the time'	E1	Allow e.g. 'Each turn takes the same amount of time' 'The wheel is spinning at the same speed' 'We do not know precisely how many degrees it turns in a second' 'The wheel turns every second' 'The wheel never stops and starts' 'The wheel is always spinning' Allow answers that state that the timing must not vary e.g. 'Each second must be accurate' Do not allow, 'The wheel turns 252° each second'.
(b)(ii) A valid impact based on their valid assumption e.g. 'If it was spinning faster, it may have turned through more degrees' or 'If it was spinning more slowly, it may have turned through fewer degrees.'	E1	If no valid assumption is made, then this mark cannot be awarded. Cannot award E0 E1. Allow e.g. 'My answer would be different.'
	(5)	

#9

(a) $\pi \times 700$ = 2199(.114858) (mm)	M1 A1	Allow 700π (mm) Accept answers in the range 2198 to 2200 (mm)
(b) 4800 (mm) = 4.8 (m)	B2 B1 (5)	B1 for sight of 1600×3 or equivalent Ignore place value errors for B1. FT 'their 4800' Award for appropriate conversion e.g 1600mm to 1.6m

#10

Component 2: Foundation Tier	Mark	Comment
(b)		
$\frac{1}{2} \times (79 + 62) \times 30$ oe	B1	(= 2115)
$\pi(30 \div 2)^2$	B1	(= 706.858...)
$(\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2) \div (\pi \times 15^2)$	M2	dep on at least B1 awarded; FT 'their area of circle' or 'their area of trapezium' for M2 or M1 (= $(2115 - 225\pi) \div 225\pi$)
OR		Award M1 for one of the following:
$\frac{1}{2} \times (79 + 62) \times 30 \div (\pi \times 15^2) - 1$		$\frac{1}{2} \times (79 + 62) \times 30 - \pi \times 15^2$ (= 1408.1..) $\frac{1}{2} \times (79 + 62) \times 30 \div (\pi \times 15^2)$. (= 2.99..) $(706.9 : 2115 =) 1 : 2.9(9\ldots)$ or $1 : 3$
$(k =) 1.9(921\ldots)$ si	A1	CAO
$(k =) 2$	B1	FT 'their 1.99...' rounded to 1 sig fig, providing at least M1 previously awarded, and a ratio obtained (not for rounding an area). An answer of $(k =) 2$ implies the previous A1 if no incorrect working seen e.g. $706.9 : 1408.1 = 1 : 2$ <i>Note: unsupported answers of 1:2 or $k = 2$ or are awarded zero marks</i>

Volume of a Cylinder: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
Total	6	

Marking Scheme

#1

Component 2: Foundation Tier	Mark	Comment
$\pi \times 7^2 \times 21 \div 102$	M2	M1 for $\pi \times 7^2 \times 21$ (= 3231 to 3233.118 or 1029π) Allow the M1 for sight of $\pi \times 7^2 \times 21$ if embedded in incorrect work e.g. $2 \times \pi \times 7^2 \times 21$
= 31 (complete cylinders)	A1	Unsupported 31.69 or 32 is awarded M2 A0
	(3)	

#2

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
$(h =) \frac{500}{\pi \times 3.5^2} = 500/38.4(8..)$ (h =) 12.98(...) to 13 (cm)	M2 A1	M1 for $500 = \pi \times 3.5^2 \times h$ CAO not from incorrect working If no marks award SC1 for an answer of: 25.97 to 26(.0) from $500 = \frac{1}{2}\pi \times 3.5^2 \times h$ OR 38.96 to 39(.0) from $500 = \frac{1}{3}\pi \times 3.5^2 \times h$
	(3)	

Volume of a Cone / Sphere: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	7	
Total	7	

Marking Scheme

#1

Component 1: Foundation Tier	Mark	Comment
(a) $\frac{1}{3} \times \pi \times 15^2 \times 30$ oe, si $\frac{1}{3} \times \pi \times 225 \times 30$ oe, si 2250π (cm³)	M1 A1 A1	Allow e.g. 3.14 substituted for π; may be in stages; Allow e.g. 3.14 substituted for π; may be in stages FT 'their 225', M1 A0 A1 is possible; Must be a multiple of π; do not ignore subsequent evaluation of e.g. 2250×3.14
(b) radius 3 cm or diameter 6 cm and height 6 cm si For the plan: draws a circle, radius 3cm and for the side elevation: draws an isosceles triangle with base 6 cm and height 6 cm	B1 B3	Correct use of the scale; may be implied by correctly drawn plan and elevation; FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' For B3, circle must be drawn with compasses and triangle must be ruled B2 FT for either an accurately drawn, correct plan or an accurately drawn, correct elevation FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their base' or 'their base = their height' or 'their diameter = their height' OR B2 FT for good sketches of both the correct plan and elevation or one sketch and one drawn accurately FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' B1 for a circular plan with any radius or for a side elevation that is an isosceles triangle with any dimensions ; allow good freehand for B1 but base of triangle must not be clearly curved If B1 B0 or B0 B0, award SC1 for an accurate plan and elevation drawn in incorrect positions
	(7)	

Pythagoras: Calculator

Question	Maximum Mark	Mark Awarded
#1	5	
#2	5	
#3	6	
Total	16	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(b) $\sqrt{1.8^2 - 0.6^2}$ (= 1.69705....)	M2	M1 for $1.8^2 - 0.6^2$ or $x^2 + 0.6^2 = 1.8^2$
$\frac{\sqrt{1.8^2 - 0.6^2} \times 0.6}{2}$ $\times 2.5$	M1	Allow FT from use of $\sqrt{1.8^2 + 0.6^2}$ (= 1.897....)
1.27(...) or 1.28 or 1.3 (m ³)	m1	
	A1	CAO

#2

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(BC ² =) $7.2^2 + 5.4^2$ or (BC ² =) 81	M1	Allow equivalent methods May be shown in further working.
(BC =) $\sqrt{7.2^2 + 5.4^2}$ or $\sqrt{81}$	A1	
(BC =) 9 (cm)	A1	FT from M1 for the correctly evaluated square root of 'their 81' provided their answer > 7.2.
(Area =) $\frac{4.9 \times 9}{2}$ = 22.05 (cm ²)	m1	FT 'their 9'
	A1	FT. Accept 22 or 22.1 from correct working.
	(5)	

#3

Component 2: Foundation Tier	Mark	Comment
(h ² =) $7.2^2 + 13.5^2$	M1	No marks are awarded for an answer of 15.3 obtained from use of a scale drawing. May be implied in later working. Provided not spoiled by answers of 20.7, 20.7 ² or 428.49.
$h^2 = 234.09$ or (h =) $\sqrt{234.09}$	A1	
(h =) 15.3	A1	FT from M1 for the correctly evaluated square root of 'their 234.09' provided 'their answer' > 13.5 (cm) Must be from correct working
(Area of square =) $((7.2 + 13.5 + 15.3) \div 4)^2$	M2	FT 'their 15.3' provided M1 previously awarded. M1 for $(7.2 + 13.5 + 15.3) \div 4$ (= 9)
81 (cm ²)	A1	FT If no marks award SC1 for the correct evaluation of $(13.5 + 7.2 + \text{'their 15.3'}) \div 4$
	(6)	

Trigonometry: Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
#2	3	
#3	4	
#4	5	
#5	6	
#6	6	
#7	6	
#8	7	
Total	40	

Marking Scheme

#1

$\sin f = 8.4/12.3$ $(f =) 43(.07\dots^\circ)$	M1 A2 (3)	A1 for $(f =) \sin^{-1}0.68(29\dots)$
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#2

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a)		
$\sin^{-1}\left(\frac{0.5}{6}\right)$	M2	M1 for $\sin(\) = \frac{0.5}{6}$
4.7(8...)	A1	Unsupported 4.7(8...) is awarded no marks

#3

Component 2: Foundation Tier	Mark	
Use of right-angled triangle with trigonometry with 3° or 87° correctly indicated with 2.5 used as a side (vertical height =) $2.5 \tan 3^\circ$ or $\frac{2.5}{\tan 87^\circ}$ 0.1(3...) (km)	S1 M2 A1	Degree symbol may be omitted throughout; lengths may be in metres throughout Angle may be marked on diagram; trig ratio used may not be correct at this stage M1 for $\tan 3^\circ = \frac{?}{2.5}$ or $\tan 87^\circ = \frac{2.5}{?}$ Not from wrong working e.g. $2.5\sin(3)$ If units are stated, they must be correct but ISW any attempt at a unit change after a correct answer has been seen Unsupported 0.1(3...) is awarded S1 only
<u>Alternative method</u> Use of right-angled triangle with trigonometry with 3° or 87° correctly indicated with 2.5 used as a side (vertical height =) $\frac{2.5 \times \sin 3}{\sin 87}$ 0.1(3...) (km)	S1 M2 A1	Angle may be marked on diagram; trig ratio used may not be correct at this stage M1 for $\frac{2.5}{\sin 87} = \frac{x}{\sin 3}$ oe Unsupported 0.1(3...) is awarded S1 only
	(4)	

#4

Component 2: Foundation Tier	Mark	Comment
$(BC =) 4.8 \tan 57^\circ \text{ or } \frac{4.8}{\tan(180-90-57)}$ 7.39 to 7.4 si $(\text{Area} =) \frac{1}{2} \times 7.39135... \times 4.8$ 17.7(392...) (cm ²)	M2 A1 M1 A1	M1 for $\tan 57^\circ = \frac{BC}{4.8}$ si or $\tan(180-90-57) = \frac{4.8}{BC}$ si CAO FT ' $\frac{1}{2} \times$ their derived $BC \times 4.8$ ' provided 'their derived BC' is from use of trigonometry FT 'their derived BC' If correct, accept answer in range 17.7 to 17.8; accept 18 following correct working
<u>Alternative (Higher tier) method 1</u> $(BC =) \frac{4.8 \times \sin 57}{\sin(90-57)}$ 7.39 to 7.4 si $(\text{Area} =) \frac{1}{2} \times 7.39135... \times 4.8$ 17.7(392...) (cm ²)	M2 A1 M1 A1	M1 for $\frac{BC}{\sin 57} = \frac{4.8}{\sin(90-57)}$ CAO FT ' $\frac{1}{2} \times$ their derived $BC \times 4.8$ ' provided 'their derived BC' is from use of trigonometry FT 'their derived BC' If correct, accept answer in range 17.7 to 17.8; accept 18 following correct working
<u>Alternative (Higher tier) method 2</u> $\text{Area of ABC} = \frac{1}{2} \times 4.8 \times AC \times \sin 57$ $(AC =) \frac{4.8}{\cos 57}$ 8.8 to 8.81(3...) si $\text{Area of ABC} = \frac{1}{2} \times 4.8 \times 8.81... \times \sin 57$ $= 17.7(392...) \text{ (cm}^2\text{)}$	M1 m2 A1 A1	Not awarded until $AC = \frac{4.8}{\cos 57}$ oe substituted. m1 for $\cos 57 = \frac{4.8}{AC}$ CAO FT 'their derived AC' If correct, accept answer in range 17.7 to 17.8; accept 18 following correct working
	(5)	

#5

(a) $\tan 42 = x/12$ $x = 12 \times \tan 42$ $x = 10.8(...)$	M1 M1 A1	Accept an answer of 11(cm) from correct working.
(b) $\sin a = \frac{10}{80}$, or equivalent $a = \sin^{-1}(\frac{10}{80})$ $a = 7(.18^\circ)$	M1 A1 A1 (6)	

#6

Component 2: Foundation Tier	Mark	Comment
Uses $EC = 6$ oe correctly in a trigonometric statement	S1	
$(BC =) \frac{6}{\cos 35}$ or $\frac{6}{\sin (90-35)}$	M2	Allow equivalent complete methods for M2 or M1
$(BC =) 7.3(246...) \text{ si}$	A1	M1 for $\cos 35 = \frac{6}{BC}$ or $\sin (90 - 35) = \frac{6}{BC}$ oe May be implied by a correct expression for the perimeter e.g. $\frac{24}{\cos 35}$ or $\frac{24}{\sin 55}$ oe
$(\text{perimeter} =) 4 \times 7.3(246...) \text{ si}$	M1	FT 'their derived BC ' providing S1 previously awarded and their $BC > 6$
$(\text{perimeter} =) 29.2(...) \text{ or } 29.3 \text{ or } 29 \text{ (cm)}$	A1	FT
	(6)	

#7

Component 2: Foundation Tier	Mark	Comment
(a) Use of trigonometry in a right-angled triangle with an angle of 48° or 42° and a side of 800 (m)	S1	Trig ratio used may not be correct at this stage.
$(h =) \frac{800}{\cos (42)}$ or $(h =) \frac{800}{\sin (48)}$	M2	Or equivalent full method. M1 for $\cos(42) = \frac{800}{h}$ or $\sin(48) = \frac{800}{h}$
$(h =) 1076(.5....) \text{ or } 1077 \text{ (feet)}$	A1	Allow 1076 from correct working
(b)(i) A correct assumption e.g. 'The (surface of) the slope is smooth (and he cycles the shortest distance).'	E1	Allow e.g. 'He rode in a straight line.' 'It was a straight line.' 'The track wasn't bumpy.' 'He cycled straight from the top to the bottom.' 'He didn't do any jumps.' 'There are no obstructions.' 'The surface is flat.' 'He cycled the shortest distance.' 'That it was 48° the whole way down'. 'That it is a right-angled triangle'. 'The track is level' (assume they mean not bumpy) Do not allow: 'That it was 48° '
(b)(ii) A correct effect of assumption e.g. 'If the surface of the slope is not smooth then Vaughan will have cycled further than the calculated value in (a).'	E1	If no valid assumption is made, then this mark cannot be awarded. Cannot award E0 E1. Allow e.g. 'He cycled further.' 'The answer would be bigger.' Do not allow: 'The answer would be different'.
	(6)	

#8

(a) Sight of appropriate measurements 0.8 (m) and 1.2 (m) Full method to find the correct angle, e.g. $\tan x = (0.8 / 1.2)$ $(x =) \tan^{-1} (0.8/1.2)$ 33.69...($^{\circ}$) or 33.7($^{\circ}$) or 34($^{\circ}$)	B1 M1 m1 A1	FT 'their 2.5 – 1.7' and 'their 2.4 ÷ 2' If no marks, then award SC1 for an answer of 56(.3°) (or equivalent unrounded irrespective of any labelling on the diagram)
(b) $2.4 \times 2.04 \div 1.7$ or $2.5 \times 2.04 \div 1.7$ 2.88 (m) or 2.9 (m) 3 (m)	M1 A1 A1 (7)	

Pythagoras / Trigonometry Combined: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	3	
Total	3	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
$(BD =) \sqrt{6^2 + 8^2}$	M1	Allow for comment e.g. 'Pythagorean triple is 6, 8, 10.' or '6, 8, 10 is a right-angled triangle.' (must be clear it is a triple and not just listing the 3 values from the diagram) Allow poor use of notation if intent is clear.
10	A1	does not imply M1 unless it is clear that $BD = 10$ (either in a statement, on the diagram or from $\tan x = \frac{10}{10}$).
45	A1	dep on all previous marks being awarded
	(3)	

Pythagoras / Trigonometry Combined: Calculator

Question	Maximum Mark	Mark Awarded
#1	6	
#2	6	
Total	12	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a) $(x^2 =) \ 11.3^2 - 8.6^2$ $x^2 = 53.73$ or $(x =) \sqrt{53.73}$ $(x =) \ 7.3(3... \text{ cm})$	M1 A1 A1	FT from M1 for the correctly evaluated square root of 'their 53.73' provided $x < 11.3$ If no marks, award SC2 for an answer of $7.3(3... \text{ cm})$ seen from use of $8.6^2 - 11.3^2$
(b) $\cos(y) = 8.6 \div 13.5$ $(y =) \cos^{-1}(8.6 \div 13.5)$ $(y =) \ 50(4.....^\circ)$	M1 m1 A1	Accept any equivalent full method
	(6)	

#2

(a) $x^2 = 96.05$ or $(x =) \sqrt{96.05}$ 9.8(cm)	M2 A1	M1 for $(x^2 =) 4.7^2 + 8.6^2$ FT from M1 for the correctly evaluated square root of 'their 96.05' provided 'their answer' > 8.6 (cm)
(b) $(y =) \sin^{-1} 8.6/12.1$ or $\sin^{-1} 0.7107...$ 45(.295...°) or 45.3(°)	M2 A1 (6)	M1 for $\sin y = 8.6/12.1$ ISW, i.e. do not accept 45.2(°) unless at least 45.29(5...°) seen previously Do not accept 45° without further explanation

Exact Trigonometric Values: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	1	
Total	1	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
1	B1 (1)	Clearly identified

Vectors: Non-Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
#2	3	
Total	5	

Marking Scheme

#1

	Mark	Comment
$\begin{pmatrix} 5 \\ -1 \end{pmatrix}$	B2	Mark final answer for B2 B1 for each element or for $(\frac{1}{2}\mathbf{p}) = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$ or seen or for $\begin{pmatrix} 5 \\ -1 \end{pmatrix}$ or for $\frac{5}{-1}$ in working space without brackets; allow $\frac{2}{1}$ seen for B1.
	(2)	

#2

GCSE (9-1) Mathematics Component 1: Foundation Tier	Mark	Comment
$(m =) 2.5$	B2	Answer space takes precedence. B1 for one of the following: • $(\mathbf{p} + \mathbf{q}) = \begin{pmatrix} 2 \\ 6 \end{pmatrix}$ not simplified e.g. $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$ • $2m = 5$
$(n = 6 \times 2.5 =) 15$	B1	Strict FT 6 x 'their m ' derived or stated – not from incorrect working.
	(3)	

Vectors: Calculator

Question	Maximum Mark	Mark Awarded
#1	2	
Total	2	

Marking Scheme

#1

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	Comment
(a)(i) $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$	B2	B1 for sight of $\begin{pmatrix} 3 \\ -5 \end{pmatrix} + \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ Allow B1 for $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ written incorrectly e.g $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$