

GCSE (9-1)

WJEC Eduqas GCSE (9-1) in MATHEMATICS

SPOTLIGHT ON Proportional Change



Spotlight on Proportional Change



1. Katie is increasing £450 by 2%.

She writes:

$$1.2 \times 450 = 540.$$

- (a) Explain why Katie is not correct.

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- (b) Work out the correct answer to Katie's problem.

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2. Using a multiplier, decrease 1200 kg by 2.5%.

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3. At the end of 2015, Arun's annual pay was £20 000.
At the start of each year, he is given a pay rise.
For 2016, Arun was given a 4% pay rise.
For 2017, he was given a 3% pay rise.

What was Arun's annual pay for 2017?

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4. £7000 is invested for 20 years at a rate of 3% per annum compound interest.

How much more than £10 000 will this investment be worth at the end of the 20-year period?
Give your answer to the nearest pound.
You must show all your working.

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5. The formula $\text{Final value} = \text{Present value} \left(1 - \frac{r}{100}\right)^n$ works out the value of a depreciating asset.

Each year, a machine depreciates in value by 15%.

- (a) Write down the decimal multiplier that can be used to work out the yearly depreciation.

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- (b) The present value of the machine is £16 000.

Use the depreciation formula to find the value of the machine after 6 years.
Give your answer to the nearest penny.

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6. (a) The formula $\text{Final value} = \text{Present value} \left(1 - \frac{r}{100}\right)^n$ works out the value of a depreciating asset.

Complete this formula for working out the value of an appreciating asset.

$$\text{Final value} = \text{Present value} \left(\quad \quad \right)$$

- (b) Elora buys a house for £150 000.
She is told that the value of her house should appreciate at the rate of 6% per year.

- (i) How much should Elora's house be worth in 5 years' time?

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- (ii) Explain why, in fact, your answer to part (i) may not be the value of Elora's house in 5 years' time.

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7. The population of a town is 45 000.
This population is increasing at a rate of 5% every year.

Show that it will take 12 years for the population to first exceed 80 000.

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8. Paul wants to invest £1000 for 5 years.
Paul is choosing between

Account A: 6% simple interest per year
Account B: 5% compound interest per year.

Which account is the better investment?
Show how you decide.

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9. When Sam started his new job in 2015, he earned £35 000 per year.
At the end of his first year, he was given a 10% pay rise.
At the end of his second year, in 2017, he was given a 7% pay rise.

(a) What is Sam's annual salary after both increases?

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(b) What is the overall percentage increase in Sam's salary for this 2-year period?

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10. At the end of April, Sian weighs her cat, Ceefer.
Ceefer has a mass of 6 kg and is overweight.
Ceefer is put on a diet.

At the end of May, Ceefer had lost 1% of his mass.

At the end of June, Ceefer had lost 2% of his mass at the end of May.

- (a) What was Ceefer's mass at the end of June?

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- (b) By what exact overall percentage has Ceefer's weight decreased in this 2-month period?

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