WJEC 2014 Online Exam Review

GCSE Science Unit 2 Foundation Tier 4782-01

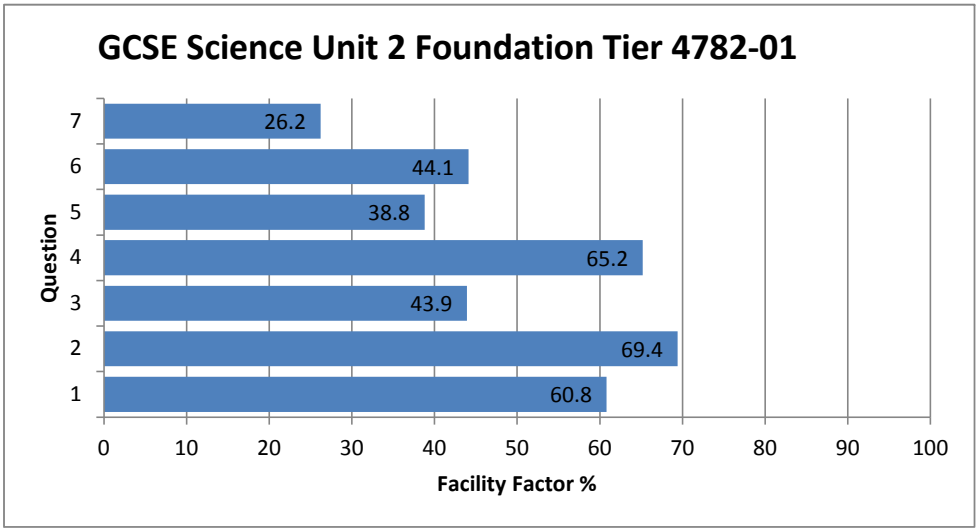
All Candidates' performance across questions

Question Title	N	Mean	S D	Max Mark	F F	Attempt %
1	507	3.6	1.5	6	60.8	99.4
2	507	6.2	2.2	9	69.4	99.4
3	506	3.1	1.9	7	43.9	99.2
4	506	5.9	1.3	9	65.2	99.2
5	505	5	2.3	13	38.8	99
6	500	3.1	1.7	7	44.1	98
7	497	2.4	1.5	9	26.2	97.5

5

6b&c

7b



Examiner only

5. Neutralisation reactions occur when acids and alkali react together. Metals can also neutralise acids. The general equation for the reaction between a metal and acid is given by:

metal + acid ⟶ salt + hydrogen

(a) Complete the word equation for the reaction below. [2]

magnesium + hydrochloric acid ⟶ ..... + ...

(b) Kate is studying the reaction between hydrochloric acid and the metal magnesium.

In her experiment she:

1. measured 25 cm^3 dilute hydrochloric acid at 20 °C with a measuring cylinder;

2. added the acid to a conical flask;

3. added 1 g of magnesium to the acid and started a stop watch;

4. measured the total volume of gas every 20 seconds.

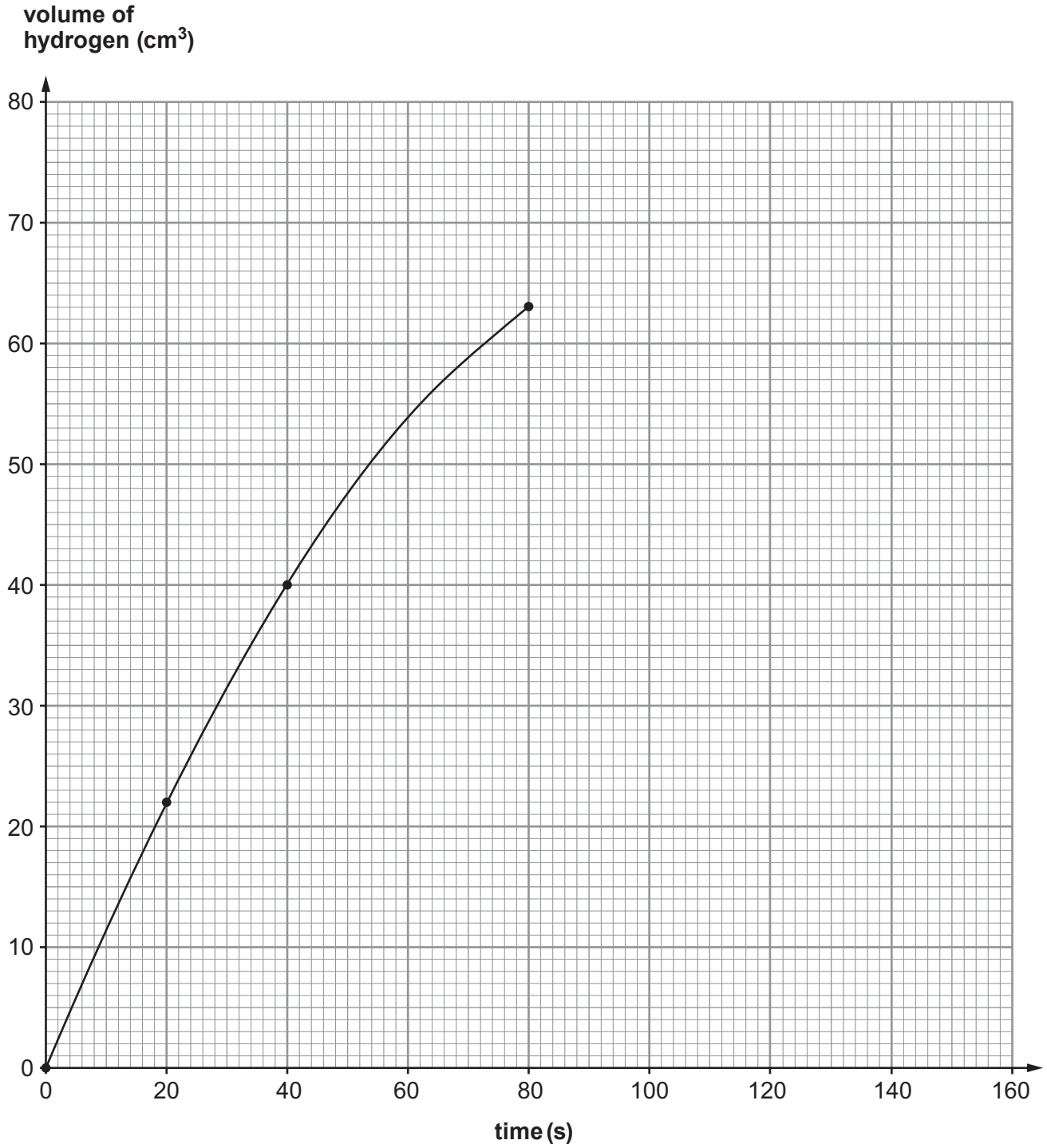
The results of her experiment are shown below.

Kate's Results

Time (s)	0	20	40	60	80	100	120	140	160
Volume of hydrogen (cm^3)	0	22	40		63	68	71	72	72

Examiner only

(i) Complete the graph of her results. [3]



Examiner only

(ii) Kate has lost her result for 60 s. Use your graph to estimate the volume of gas at 60 s. [1]

..... cm^3

(iii) State **one** way in which Kate can improve the validity of her experiment. [1]

.....

(iv) Explain what happens to the pH during this reaction. [2]

.....

.....

.....

(v) Predict the volume of hydrogen you would expect to be collected after 200 s. Give **one** reason for your answer. [2]

.....

.....

.....

(c) Kate wants to compare the volume of hydrogen given off every 20 seconds if she repeated the experiment with iron instead of magnesium. State **two** variables that need to be controlled to ensure a fair test. [2]

1. .....

2. .....

13

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(a) Complete the word equation for the reaction below. [2]

magnesium + hydrochloric acid ⟶ magnesium chloride + water

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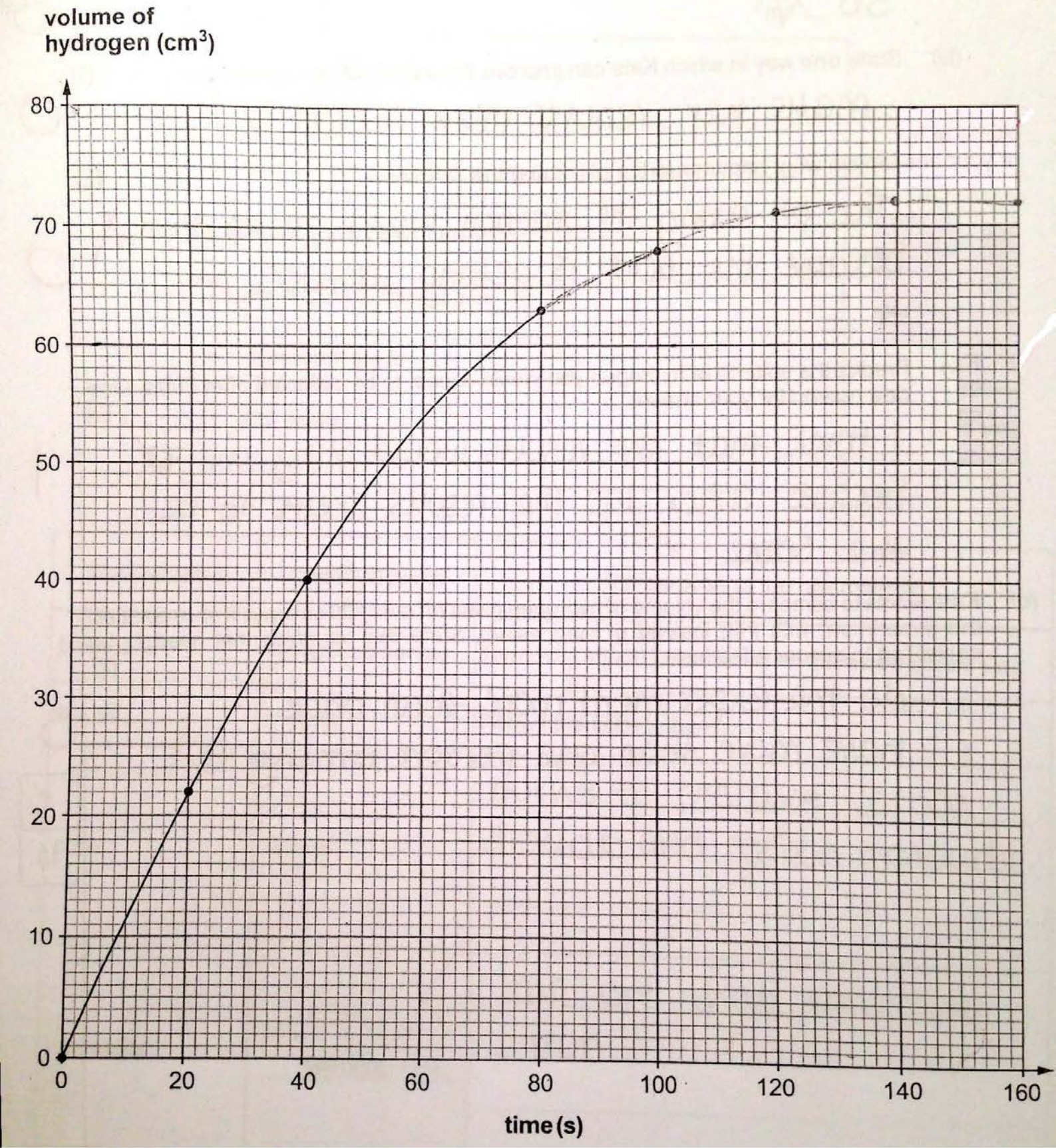

Examine only

(ii) Kate has lost her result for 60 s. Use your graph to estimate the volume of gas at 60 s. [1]

50 cm^3

(iii) State **one** way in which Kate can improve the validity of her experiment. [1]

make her results more reliable.

[2]

(iv) Explain what happens to the pH during this reaction. [2]

The pH during the reaction would go down, because the acid is getting stronger.

(v) Predict the volume of hydrogen you would expect to be collected after 200 s. Give **one** reason for your answer. [2]

I think that the results would stay at 72 because after 140 the results seem to be the same.

(c) Kate wants to compare the volume of hydrogen given off every 20 seconds if she repeated the experiment with iron instead of magnesium. State **two** variables that need to be controlled to ensure a fair test. [2]

1. do the experiment more than once.
2. have more than one person timing it

13

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(a) Complete the word equation for the reaction below.

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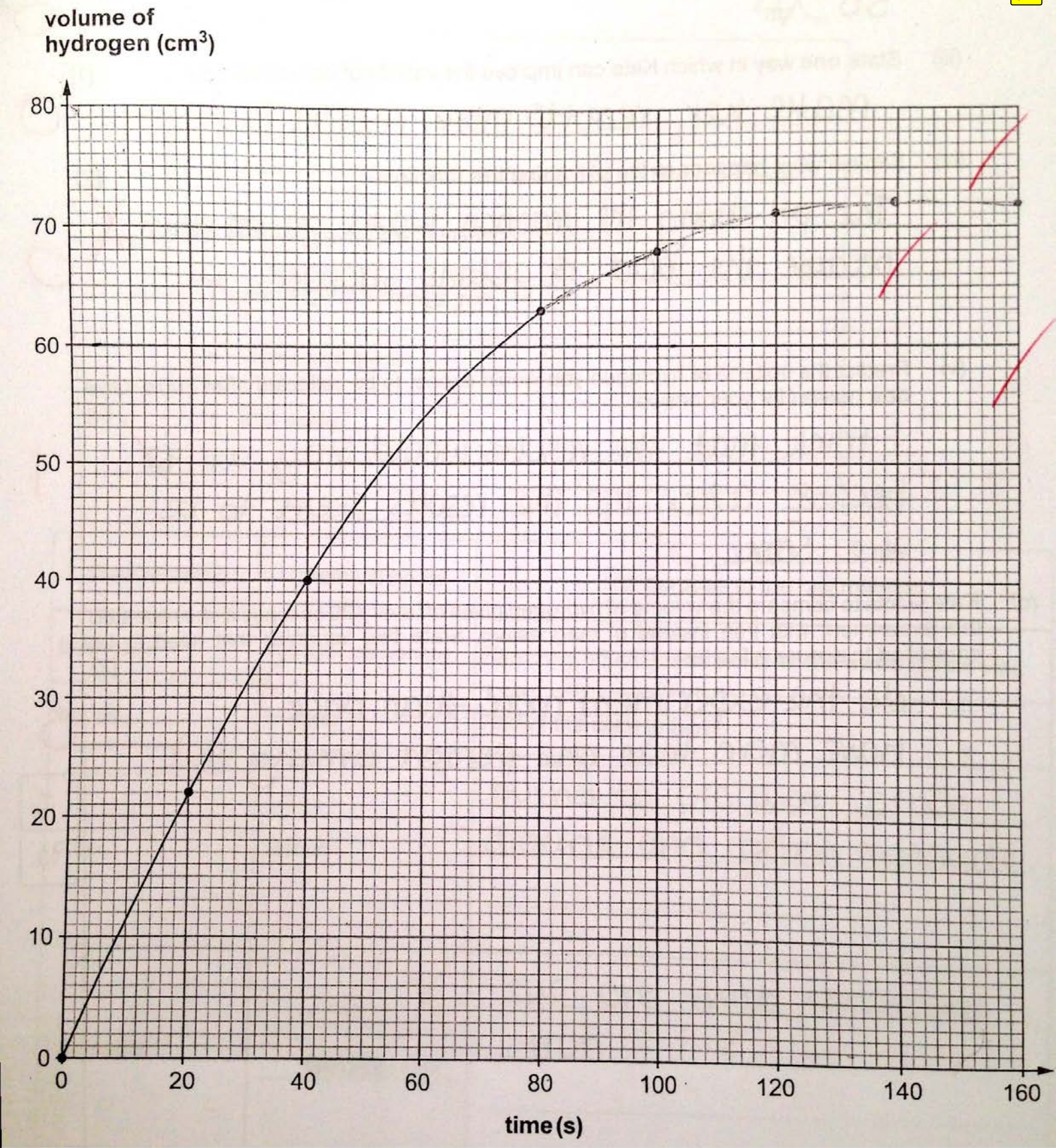

Examiner only

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5

13

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metal + acid ⟶ salt + hydrogen

(a) Complete the word equation for the reaction below. [2]

magnesium + hydrochloric acid ⟶ metal x1 + cloride x2

(b) Kate is studying the reaction between hydrochloric acid and the metal magnesium.

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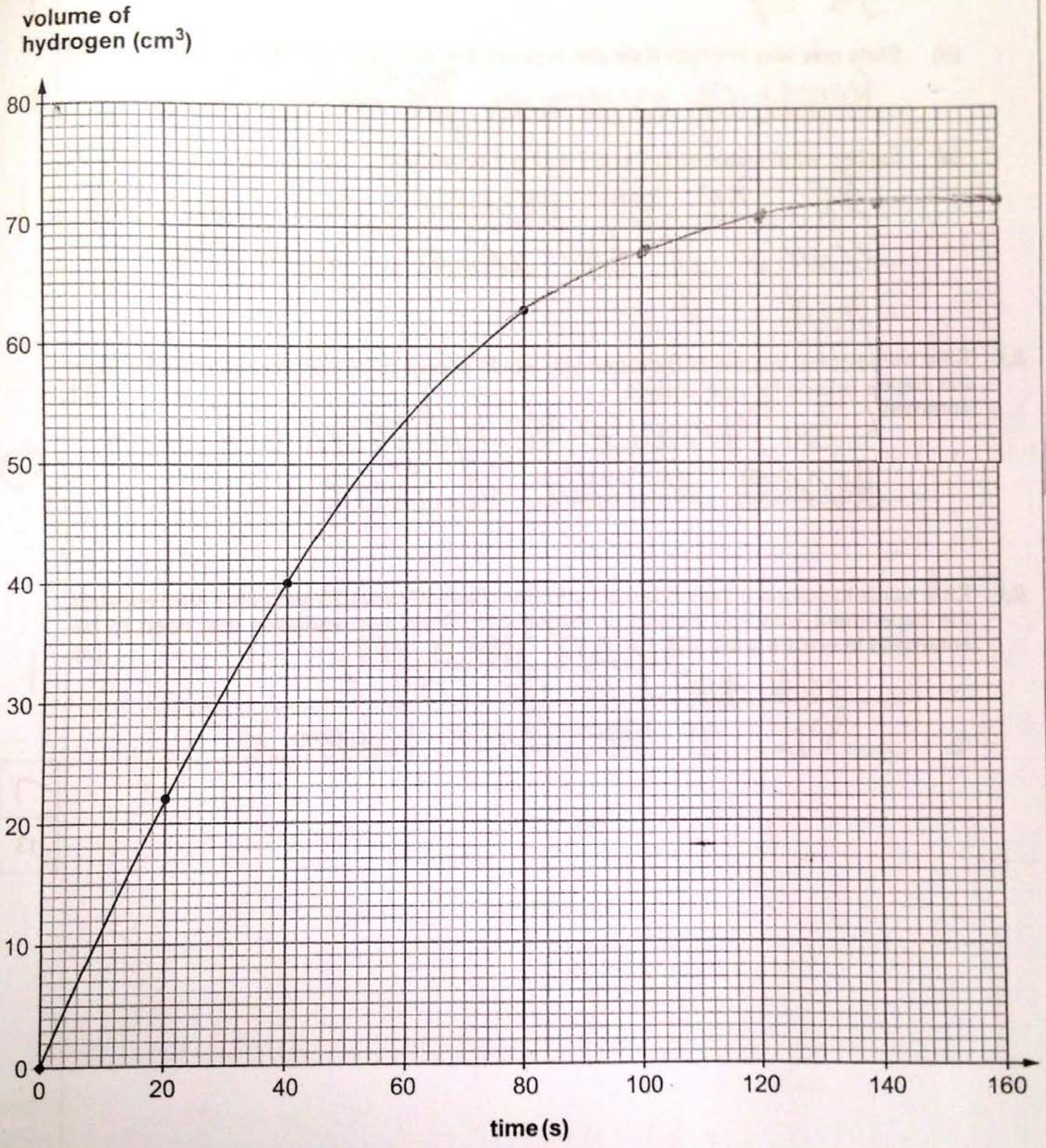

(ii) Kate has lost her result for 60 s. Use your graph to estimate the volume of gas at 60 s. [1]

54 cm^3

(iii) State **one** way in which Kate can improve the validity of her experiment. [1]

Repeating experiment multiple times

(iv) Explain what happens to the pH during this reaction. [2]

The pH increases we know this because of the arrows from the graph

(v) Predict the volume of hydrogen you would expect to be collected after 200 s. Give **one** reason for your answer. [2]

67 cm^3 because the hydrogen will soon decrease in time.

(c) Kate wants to compare the volume of hydrogen given off every 20 seconds if she repeated the experiment with iron instead of magnesium. State **two** variables that need to be controlled to ensure a fair test. [2]

1. add the 1 g of iron
2. Put in the same volume

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magnesium + hydrochloric acid ⟶ metal + cloride

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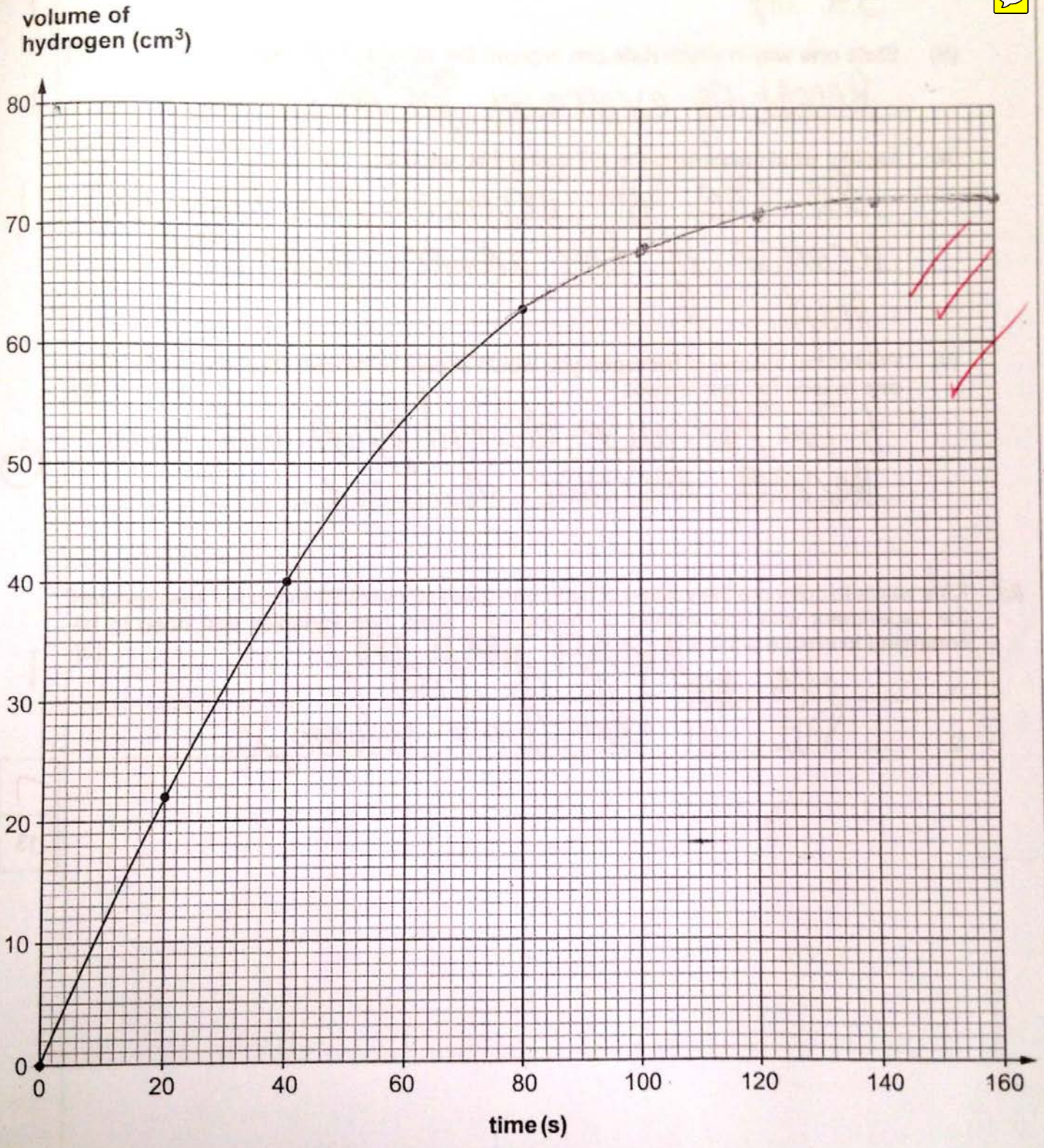

3

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54 cm^3

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Repeating experiment multiple times

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6 7cm^3 because the hydrogen will soon decrease in time.

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1. adds one 1 g of iron
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Examiner only

1
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13

Examiner only

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Kate's Results

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Volume of hydrogen (cm^3)	0	22	40	[illegible]	63	68	71	72	72

Examiner only

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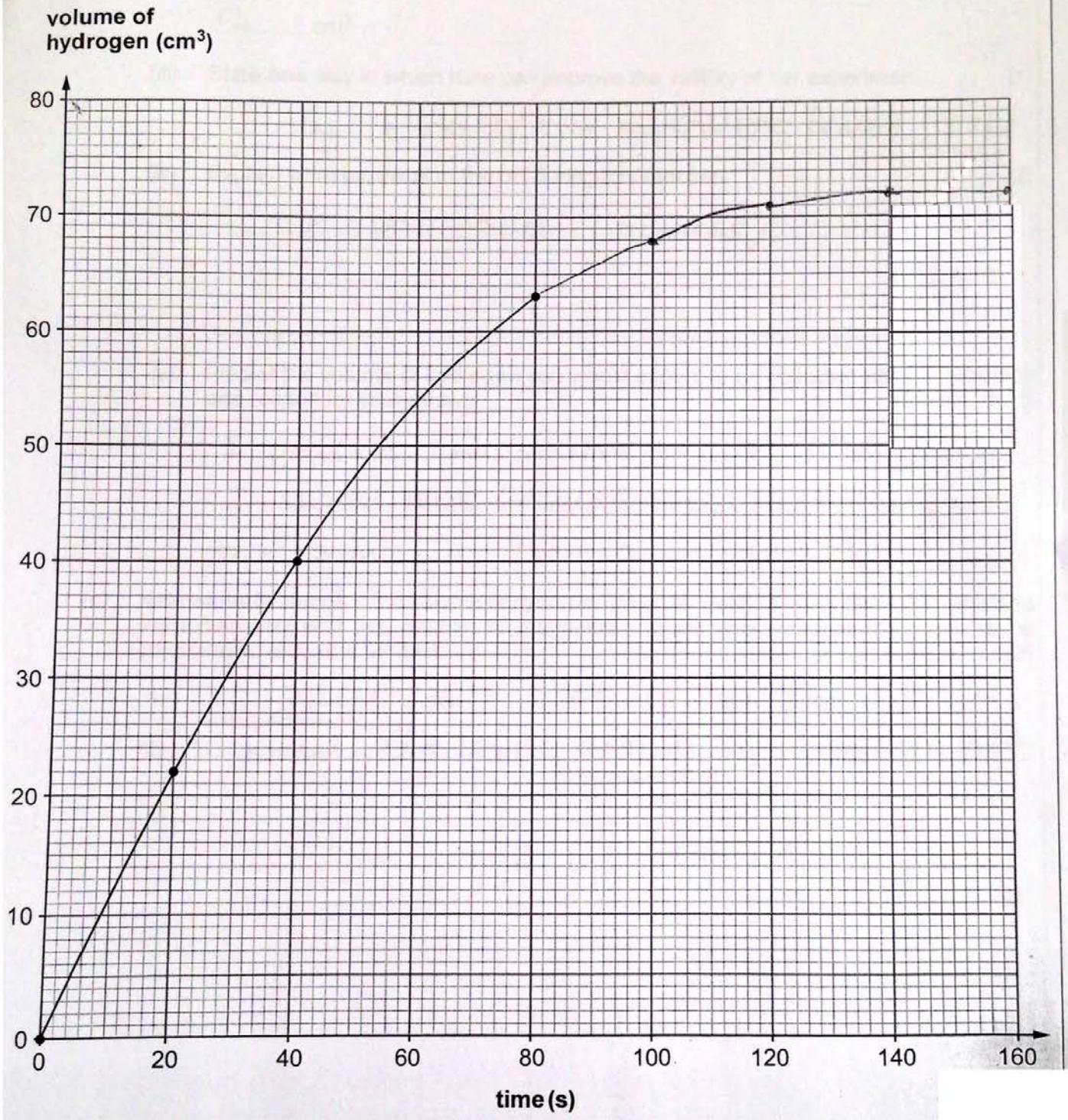

Examiner only

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54 cm^3

(iii) State **one** way in which Kate can improve the validity of her experiment. [1]

By re-doing the experiment formore reliable results.

(iv) Explain what happens to the pH during this reaction. [2]

The pH would increase

(v) Predict the volume of hydrogen you would expect to be collected after 200 s. Give **one** reason for your answer. [2]

I predict the volume to be 72 cm^3, I think this because 140s and 160s are the same, it didnt increase

(c) Kate wants to compare the volume of hydrogen given off every 20 seconds if she repeated the experiment with iron instead of magnesium. State **two** variables that need to be controlled to ensure a fair test. [2]

1. Need to add 1g of iron just like magnesium.
2. Need the same amount of Hydrochloric acids.

13

Examiner only

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Examiner only

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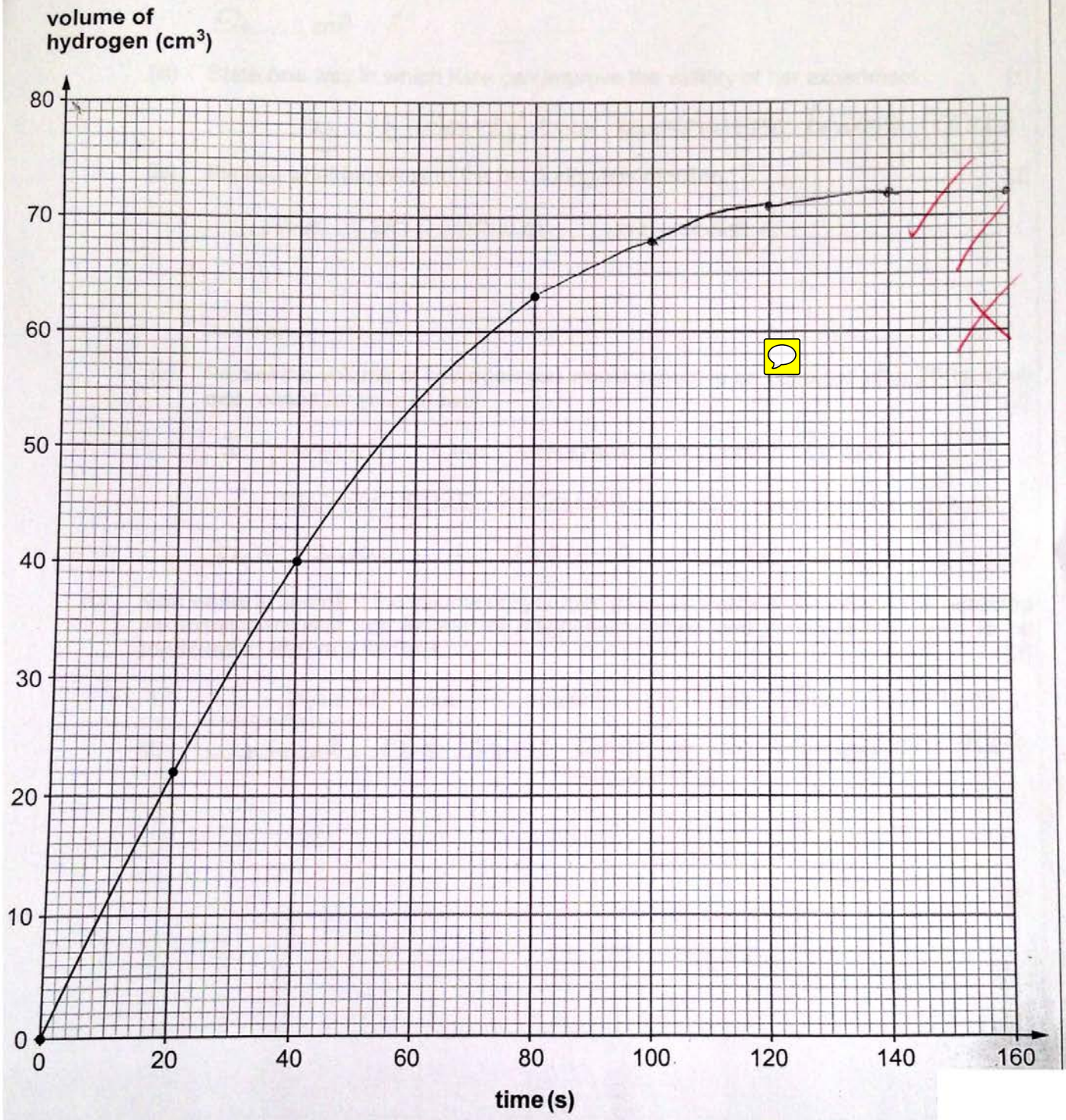

Examiner only

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By re-doing the experiment for more reliable results. 1

(iv) Explain what happens to the pH during this reaction. [2]

The pH would increase 1

(v) Predict the volume of hydrogen you would expect to be collected after 200 s. Give **one** reason for your answer. [2]

I predict the volume to be 72 cm^3, 1

I think this because 140s and 160s are the same, it didn't increase.

(c) Kate wants to compare the volume of hydrogen given off every 20 seconds if she repeated the experiment with iron instead of magnesium. State **two** variables that need to be controlled to ensure a fair test. [2]

1. Need to add 1g of iron just like magnesium. 1
2. Need the same amount of Hydrochloric acids. 0

10

13

6.

Examiner only

(b) The table below shows information about the materials required for the production of **one tonne** of iron.

Complete the table to calculate the total cost of producing **one** tonne of iron. [2]

Raw material	Mass needed (tonnes)	Cost per tonne of raw material (£)	Cost in producing one tonne of iron (£)
iron ore	1.75	60	105
coke	0.25	120	30
limestone	0.25	80	20
hot air	4.0	2	.....
		Total cost	£ .....

(c) Aluminium is also extracted from its ore. Explain why aluminium cannot be extracted in a blast furnace using coke (carbon). [2]

.....

.....

.....

7

Turn over.

Examiner only

6.

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iron ore	1.75	60	105
coke	0.25	120	30
limestone	0.25	80	20
hot air	4.0	2	8
		Total cost	£ 163

(c) Aluminium is also extracted from its ore. Explain why aluminium cannot be extracted in a blast furnace using coke (carbon). [2]

Aluminium cannot be extracted using a blast furnace because it's too high up in the ~~reactivi~~ reactivity ~~series~~ series.

7

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Examiner only

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hot air	4.0	2	8 ✓
		Total cost	£ 163 ✓

2

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Aluminium cannot be extracted using a blast furnace because it's too high up in the ~~reactivt~~ reactivity ~~series~~ series. ~~Therefore~~

Bad

1

5

6.

Examiner only

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hot air	4.0	2	8
		Total cost	£ 163

(c) Aluminium is also extracted from its ore. Explain why aluminium cannot be extracted in a blast furnace using coke (carbon). [2]

It will melt to fast causing it to be unstable.

7

Examiner only

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Examiner only

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limestone	0.25	80	20
hot air	4.0	2	0·5
		Total cost	£ 155·50

(c) Aluminium is also extracted from its ore. Explain why aluminium cannot be extracted in a blast furnace using coke (carbon). [2]

Aluminium is too reactive to be used in a blast furnace, it is extracted from its ore in a electrolysis

6.

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Examiner only

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		Total cost	£ 155·50 ecf

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4

7

Examiner only

7. *(b)* Explain the benefits of using less plastic.

Your answer should refer to: [6 QWC]

- use of resources
- economic impact
- environmental impact.

Ex

(b) Explain the benefits of using less plastic.

[6 QWC]

Your answer should refer to:

- use of resources
- economic impact
- environmental impact.

The benefits of using less plastic bags is mostly on the environment. This is because, when we didn't have to pay for plastic bags, we would just throw them on the streets when we were finished with them which indanger wildlife, because they would have thought that it would be food and get themselfs stuck in the plastic bags. Also it helps the environment, because the plastic bags these days are biodegradable which help & make this planet a better place to live and they don't take so long to decompose. Another reason is the economic impact, because we have to pay for plastic bags, all of the money goes to the government which might help us get better resources for towns, schools, parks ect.

END OF PAPER

7.

Examiner only

(b) Explain the benefits of using less plastic.

[6 QWC]

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1
2

7.

(b) Explain the benefits of using less plastic.

Your answer should refer to:
- use of resources
- economic impact
- environmental impact.

[6 QWC]

Examiner only

Using less plastic is a benefit because it allows us to use it for different things. Saving plastic will ensure it doesn't run out and will keep our world more eco-friendly. Thermoset plastic can't be recycled well and can only be reused. If we threw out items that were thermoset we would be wasting plastic and also losing money. It would also have a positive effect on the environment with no plastic bags to hurt animals or ruin scenery.

7.

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[6 QWC]

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1

7.

(b) Explain the benefits of using less plastic.

Your answer should refer to:
- use of resources
- economic impact
- environmental impact.

[6 QWC]

The benefits of using plastics is that they are some strong plastics, some bendy plastics and some plastics that won't melt but will burn. Plastics are used a lot in a lot of things just like Metals. They can be used for something to keep something in like a container box. They can also be recycled and reused. But it is better to use less of it as you need to create plastic by using trees etc. Plastics are not renewable, they damage enviroment, they also take a very long time to rot. The less plastic the more people will recycle and reuse it too. using less plastic will help the enviroment and Earth a lot more by keeping trees etc.

END OF PAPER

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