AQA

Please write clearly in block capitals.

Centre number | | | | | |  Candidate number | | | | |

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I declare this is my own work.

# GCSE MATHEMATICS

# H

## Higher Tier  Paper 2  Calculator

Wednesday 4 June 2025  Morning  Time allowed: 1 hour 30 minutes

**Materials**

For this paper you must have:
- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).

**Instructions**
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

**Information**
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper.
- These must be tagged securely to this answer book.

**Advice**

In all calculations, show clearly how you work out your answer.

| For Examiner's Use | |
|---|---|
| Pages | Mark |
| 2–3 | |
| 4–5 | |
| 6–7 | |
| 8–9 | |
| 10–11 | |
| 12–13 | |
| 14–15 | |
| 16–17 | |
| 18–19 | |
| 20–21 | |
| 22–23 | |
| 24–25 | |
| **TOTAL** | |

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Answer **all** questions in the spaces provided.

**1 (a)** Work out the highest common factor (HCF) of 16 and 24

**[1 mark]**

Answer _____

**1 (b)** Work out the lowest common multiple (LCM) of 10 and 15

**[1 mark]**

Answer _____

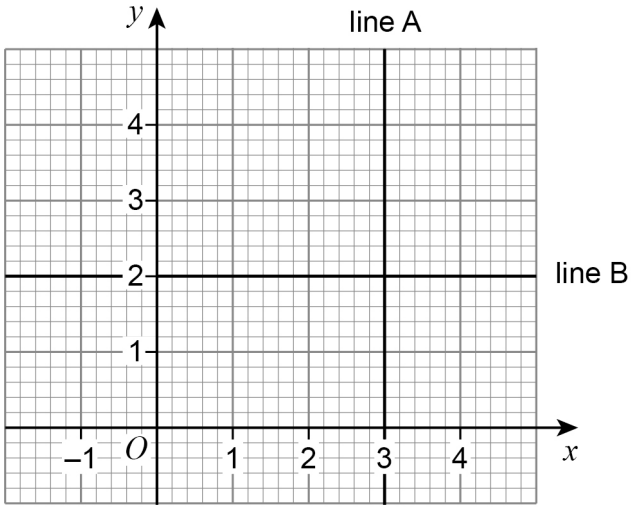
**1 (c)** Write 42 as a product of its prime factors.

**[1 mark]**

Answer _____

Do not write outside the box

**2** Here are lines A and B.




Complete these statements.

**[2 marks]**

The **equation** of line A is _____

The **gradient** of line B is _____

**Turn over for the next question**

5

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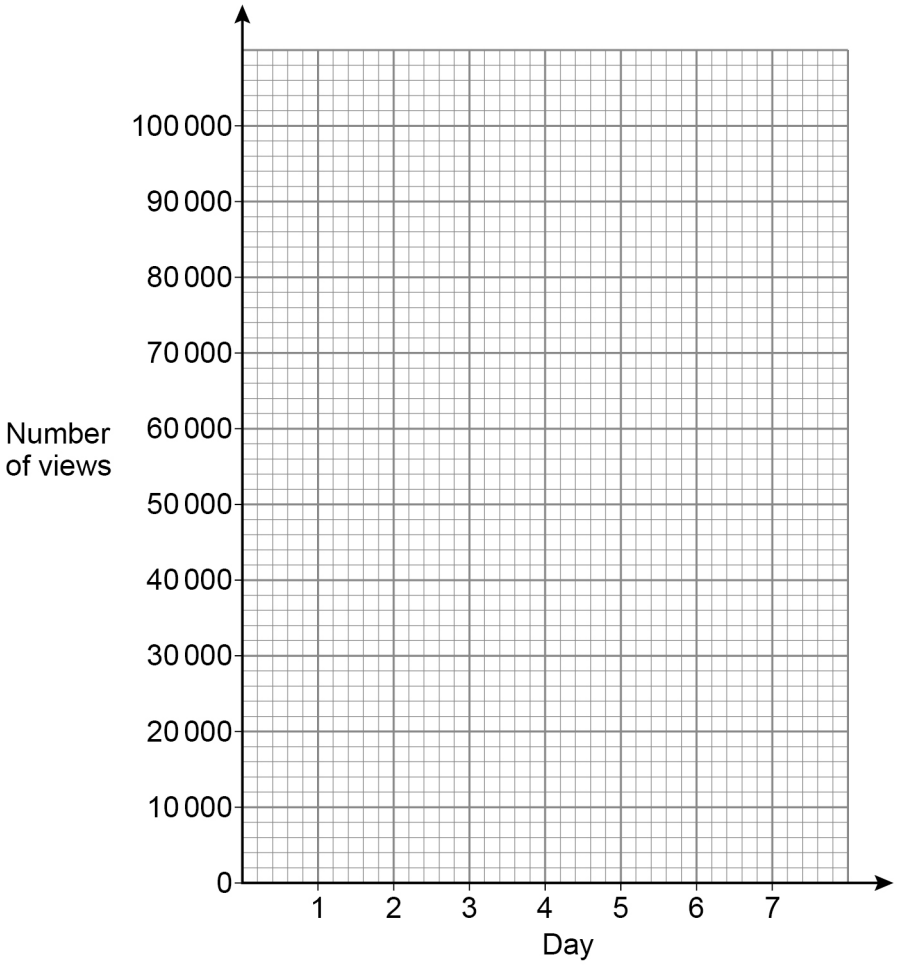
**3** Youssuf posted an advert on his social media channel.

The table shows the number of views of the advert during its first 6 days.

| **Day** | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Number of views** | 49 000 | 95 000 | 87 000 | 77 000 | 64 000 | 48 000 |

**3 (a)** On the grid, draw a time series graph to represent the data.

**[2 marks]**



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**3 (b)** Youssuf receives 0.018p for each view of the advert.

Estimate how much he receives from views of the advert on **day 7**

**[3 marks]**

Answer £ _____

**4** 70% of the discs in a box are red and the rest are blue.

- 40% of the red discs are removed.
- 50% of the blue discs are removed.

In total, what percentage of the discs are removed from the box?

**[3 marks]**

Answer _____ %

8

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**5 (a)** The length of a fence panel is 160 cm to the nearest 10 cm

Complete the error interval.

**[2 marks]**

Answer _____ cm $\leqslant$ length $<$ _____ cm

**5 (b)** A different fence panel measures 2 metres to the nearest 10 cm

Kim says that the total length of **three** of these fence panels must be less than 6.2 m

Show that Kim is correct.

**[2 marks]**

**6** Circle the expression which is a factor of $3x + 15$

**[1 mark]**

$3x$ $x + 12$ $x + 5$ $x + 15$

Do not write outside the box

**7** The five possible outcomes of an event are A, B, C, D and E.

The table shows some of the probabilities.

| **Outcome** | A | B | C | D | E |
|---|---|---|---|---|---|
| **Probability** | 0.18 | 0.2 | | | |

$P(C) = P(B) + 0.1$

$P(D) = P(E)$

Work out $P(D)$

**[3 marks]**

Answer _____

**Turn over for the next question**

8

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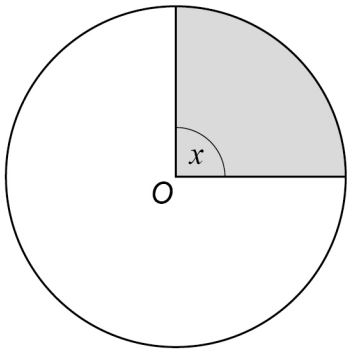
**8** Here is a circle, centre *O*.

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**8 (a)** The circle has a circumference of 20 cm

Assume that angle $x$ is 90°

Work out the shaded area.

Give your answer as a decimal.

**[3 marks]**

Answer _____ $cm^2$

Do not write outside the box

**8 (b)** In fact, angle $x$ is smaller than 90°

What does this mean about the shaded area?

Tick **one** box.

**[1 mark]**

☐ It is smaller than the answer to part (a)

☐ It is the same as the answer to part (a)

☐ It is larger than the answer to part (a)

☐ It could be any of the above

**9** The number of people that follow an influencer increases from 35 000 to 70 000

The influencer says,

"My number of followers has increased by 200%, because 70 000 is 35 000 times 2"

Are they correct?

Tick a box.

Yes ☐ No ☐

Give a reason for your answer.

**[1 mark]**

5

**Turn over ►**

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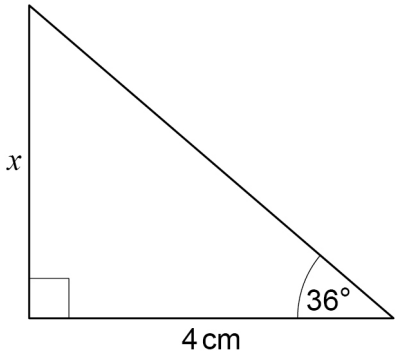
**10**

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Use trigonometry to work out the value of $x$.

You **must** show your working.

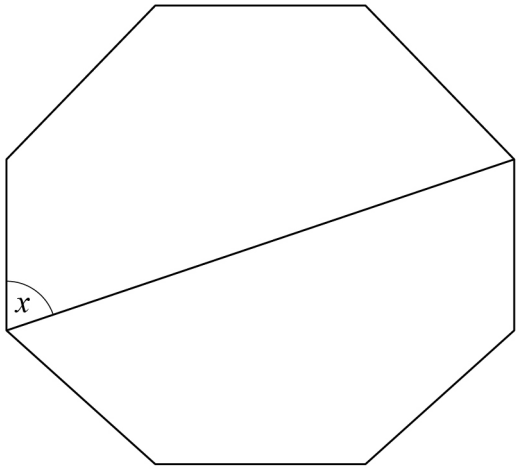
**[3 marks]**

$x =$ _____ cm

Do not write outside the box

**11** A straight line is drawn across a **regular** octagon.

Not drawn accurately




Work out the size of angle $x$.

**[3 marks]**

$x =$ _____ °

6

**Turn over ►**

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**12** Greg and Hanna want to know if students at their school think lunchtime clubs are important.

**12 (a)** Greg asks 15 people at the lunchtime chess club.

Give **one** reason why his results may **not** represent the whole school.

**[1 mark]**

**12 (b)** Here are Hanna's results.

- 62% answered Important.
- 24% answered Not Important.
- The rest answered Don't Know.

93 students answered Important.

How many students answered Don't Know?

**[3 marks]**

Answer _____

Do not write outside the box

**13** Emma and Chan each drive 154 miles from A to B.

Emma drives the whole way at an average speed of 56 miles per hour.

Chan drives

85 miles at an average speed of 50 miles per hour

and then

the rest of the way at an average speed of 60 miles per hour.

Who takes **less** time, Emma or Chan?

Show working to support your answer.

**[4 marks]**

Answer _____

8

**Turn over ►**

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**14** $a$, $b$ and $c$ are **positive integers**.

$$a(9x + 2) \equiv 45x + 3b + c$$

Work out **one** possible set of values for $a$, $b$ and $c$.

**[3 marks]**

$a =$ _____ $b =$ _____ $c =$ _____

Do not write outside the box

**15** Solve $3x^2 + 5x - 9 = 0$

Give your solutions as decimals.

**[2 marks]**

Answer _____ and _____

**16** The value of a second-hand car decreases by 12.1% per year.

Work out the number of full years until the car loses **more** than half its value.

You **must** show your working.

**[3 marks]**

Answer _____ years

8

**Turn over ►**

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**17** When a biased coin is spun, P(Heads) : P(Tails) = 5 : 2

In a game, the player spins the coin four times.

The player can win in **two** ways.

| **1st way to win** | **2nd way to win** |
|---|---|
| Spin 4 heads | Spin a Head, then a Tail, then a Head, then a Tail |

How many times more likely is a player to win the 1st way than the 2nd way?

**[3 marks]**

Answer _____

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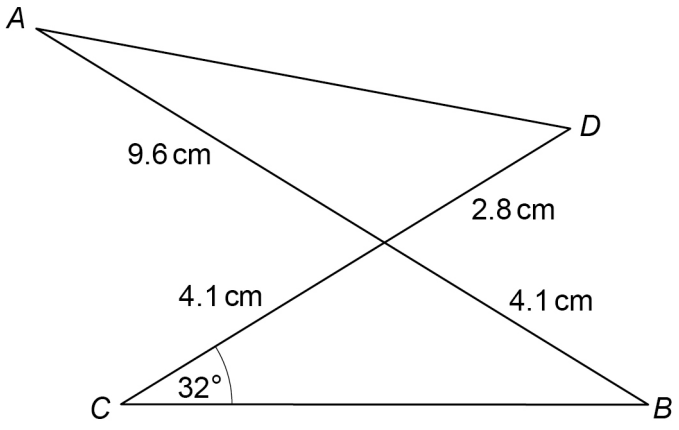
**18** Lines *AB*, *BC*, *CD* and *AD* form two triangles.

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Work out the length of *AD*.

**[4 marks]**

Answer _____ cm

7

**Turn over ►**

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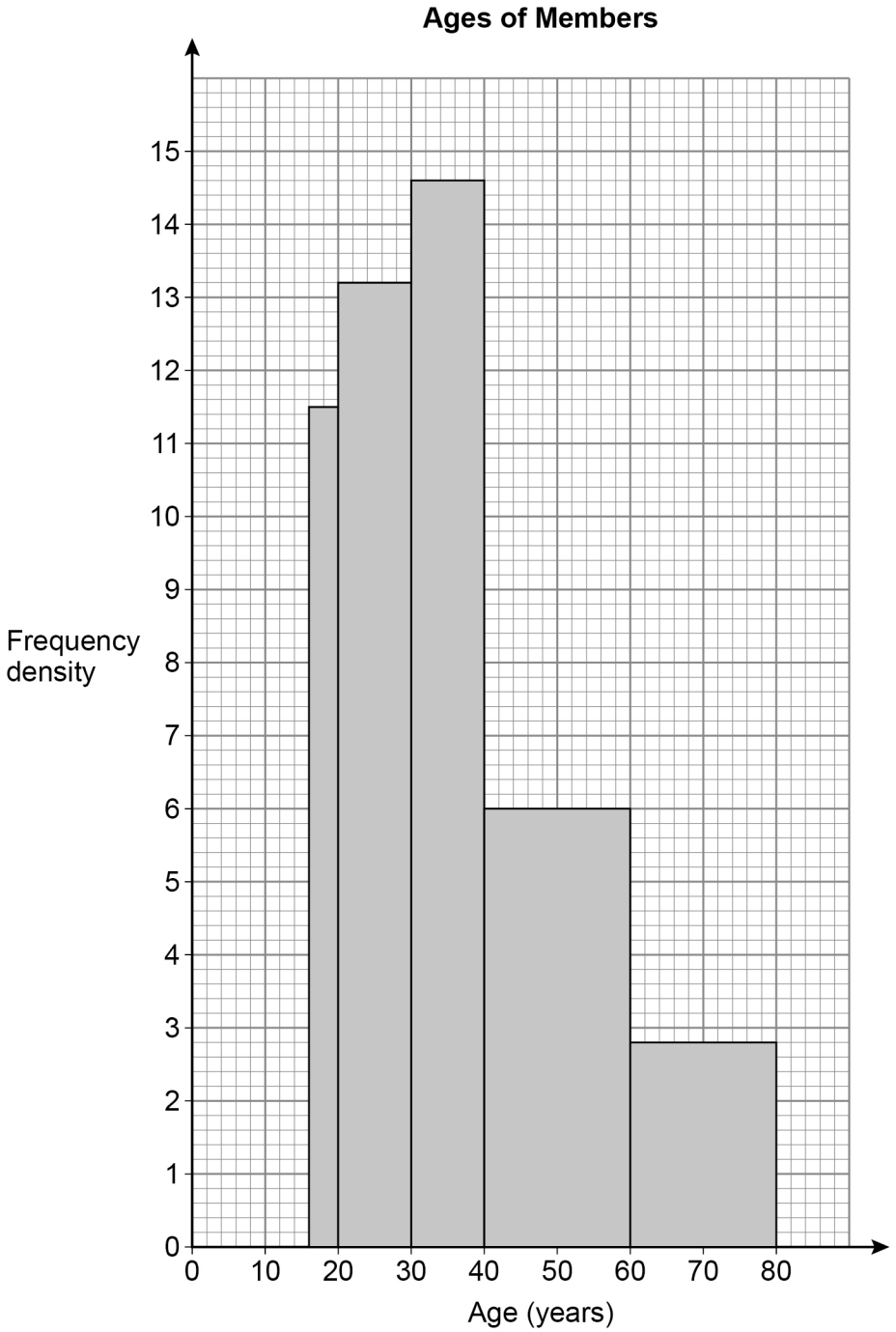
**19** The histogram represents the ages of the 500 members of a gym.

The first bar represents the members aged at least 16 and under 20



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Each member pays an annual fee based on their age.

| **Age** | Under 65 | 65 or over |
|---|---|---|
| **Annual fee** | £275 | £129 |

Use the histogram to estimate the **total** annual fees paid by these members.

**[4 marks]**

Answer £ _____

4

**Turn over ►**

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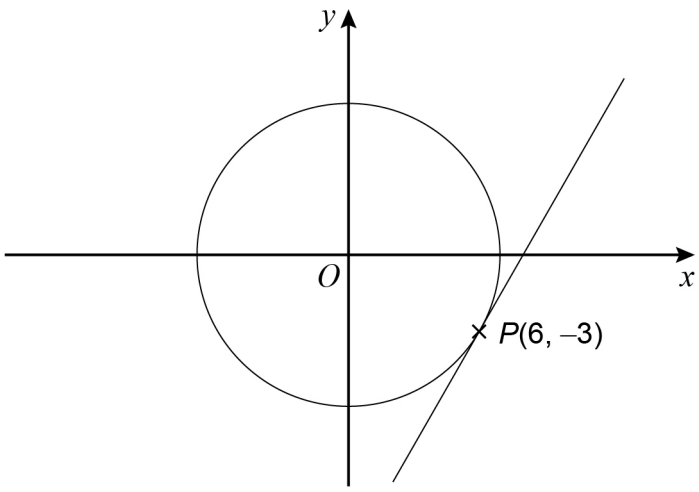
**20** David has solved the inequality $x^2 < 16$ and represented his solution on the number line below.

Give **one** reason why David's solution is wrong.

**[1 mark]**

**21** A circle with centre $O$ and radius $\sqrt{45}$ has a tangent drawn at point $P(6, -3)$

Not drawn accurately




**21 (a)** Write down the equation of the **circle**.

**[1 mark]**

Answer _____

Do not write outside the box

**21 (b)** Work out the equation of the **tangent**.

Give your answer in the form $y = mx + c$

**[4 marks]**

Answer _____

**Turn over for the next question**

6

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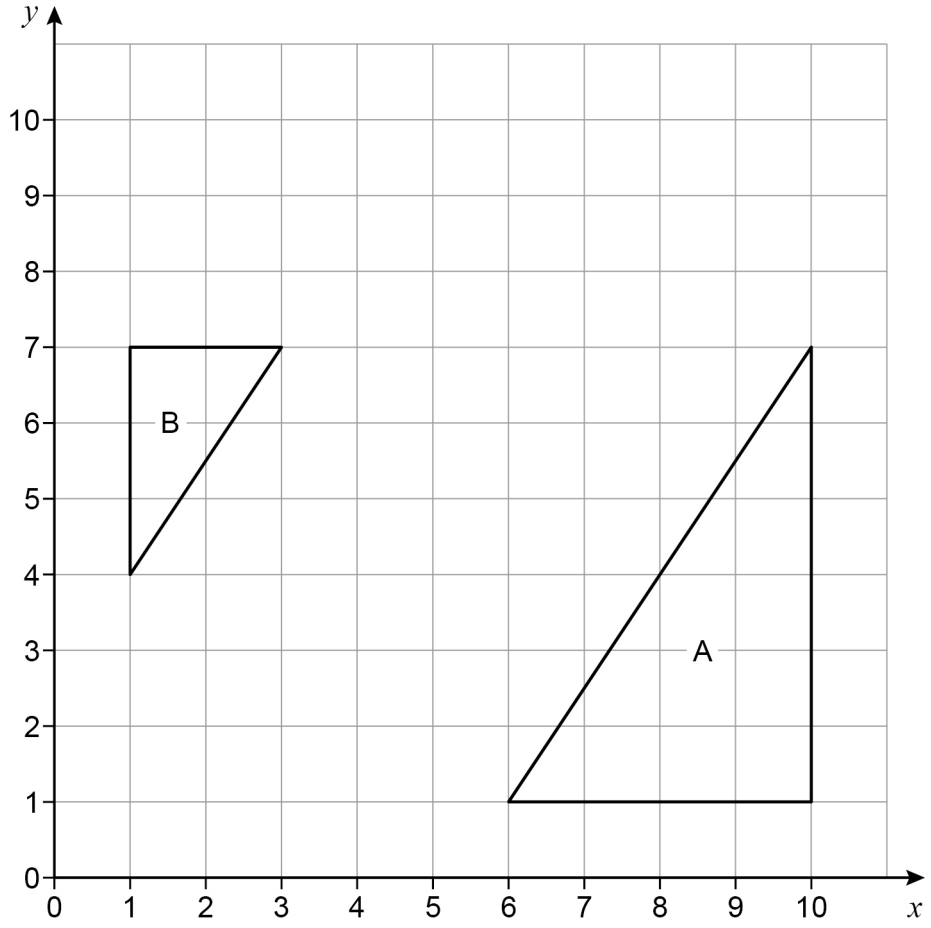
**22** Shape A and shape B are shown on the grid.




Describe the **single** transformation that maps shape A to shape B.

**[3 marks]**

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**23** *ABCD* is a quadrilateral.

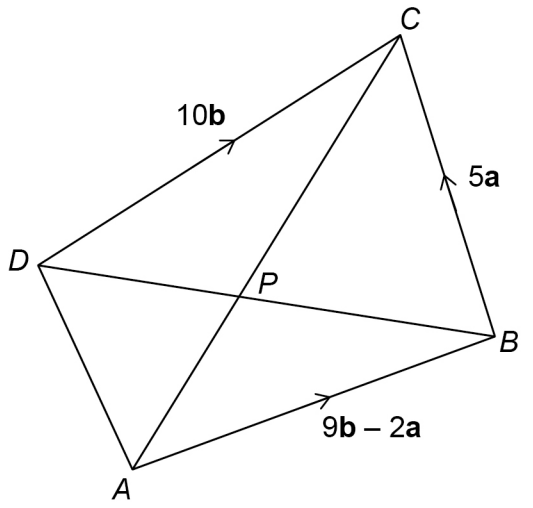
*AC* and *BD* intersect at *P*.

$\overrightarrow{AB} = 9\mathbf{b} - 2\mathbf{a}$

$\overrightarrow{BC} = 5\mathbf{a}$

$\overrightarrow{DC} = 10\mathbf{b}$

Not drawn accurately




$BP : PD = 3 : 2$

$AP : PC = 1 : k$

Work out the value of $k$.

You **must** show your working.

**[5 marks]**

$k =$ _____

8

**Turn over ►**

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**24** A study suggests a student's exam mark, $m$, is directly proportional to the cube root of total revision time, $t$ hours.

A student doubles their total revision time.

Work out the percentage increase in their exam mark.

**[3 marks]**

Answer _____ %

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**25** $\mathrm{f}(x) = ax + b$ and $\mathrm{g}(x) = \dfrac{x+b}{a}$ where $a$ and $b$ are positive integers.

Prove that $\mathrm{fg}(x) - a\mathrm{f}^{-1}(x)$ is always a multiple of 3

**[4 marks]**

**END OF QUESTIONS**

7

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**ANSWER IN THE SPACES PROVIDED**

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| Question number | **Additional page, if required.**<br>**Write the question numbers in the left-hand margin.** |
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