

OXFORD

INTERNATIONAL
AQA EXAMINATIONS

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

INTERNATIONAL GCSE MATHEMATICS EXTENSION

E

Paper 2E

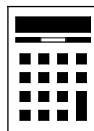
Wednesday 16 November 2022 07:00 GMT

Time allowed: 2 hours

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



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 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

- Show all necessary working; otherwise marks for method may be lost.

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

26–27

TOTAL



N 0 V 2 2 9 2 6 0 2 E 0 1

IB/M/Nov22/E8

9260/2E

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

- 1** Circle the answer to $\frac{24^2 + \sqrt{196}}{\sin 30^\circ}$ **[1 mark]**

295

604

1180

1544

- 2** Work out 10 as a percentage of 4
Circle your answer. **[1 mark]**

40%

60%

150%

250%

- 3** Circle the equation that means
 x is 5 less than the square of y **[1 mark]**

$x = y^2 - 5$

$x = (y - 5)^2$

$x = 5 - y^2$

$x = (5 - y)^2$



- 4 Circle the point that lies on the curve $y = \frac{1}{x}$

[1 mark]

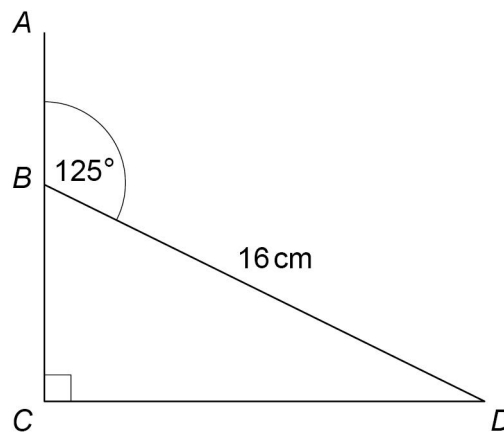
(0.25, 5)

(-0.5, 0.5)

(1, -1)

(1.25, 0.8)

- 5 BCD is a triangle.
 ABC is a straight line.

Not drawn
accuratelyWork out the length CD .

[3 marks]

Answer _____ cm

Turn over ►



6 (a) The first four terms of a linear sequence are

4 13 22 31

Work out an expression for the n th term.

[2 marks]

Answer _____

6 (b) A different sequence has n th term $\sqrt{n}$

Is one of the terms in the sequence equal to 7?

Tick a box.

Yes

☐

No

☐

Give a reason for your answer.

[1 mark]



7 Show that $\frac{2}{5} \times 3\frac{3}{4} = 1\frac{1}{2}$

[2 marks]

- 8 Lexi spins a biased coin 50 times.
Arran spins the same coin 70 times.
Here are the results.

	Number of heads	Number of tails
Lexi	24	26
Arran	42	28

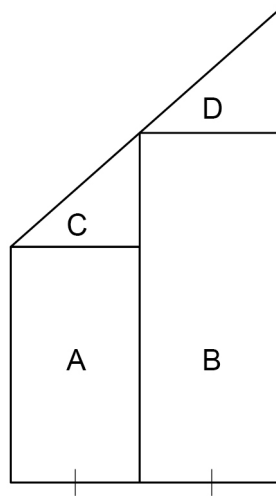
Use the results to work out the **best** estimate of the probability of getting a head.

[2 marks]

Answer _____



- 9 A trapezium is made from two rectangles and two triangles.
The rectangles have the same **width**.



Not drawn
accurately

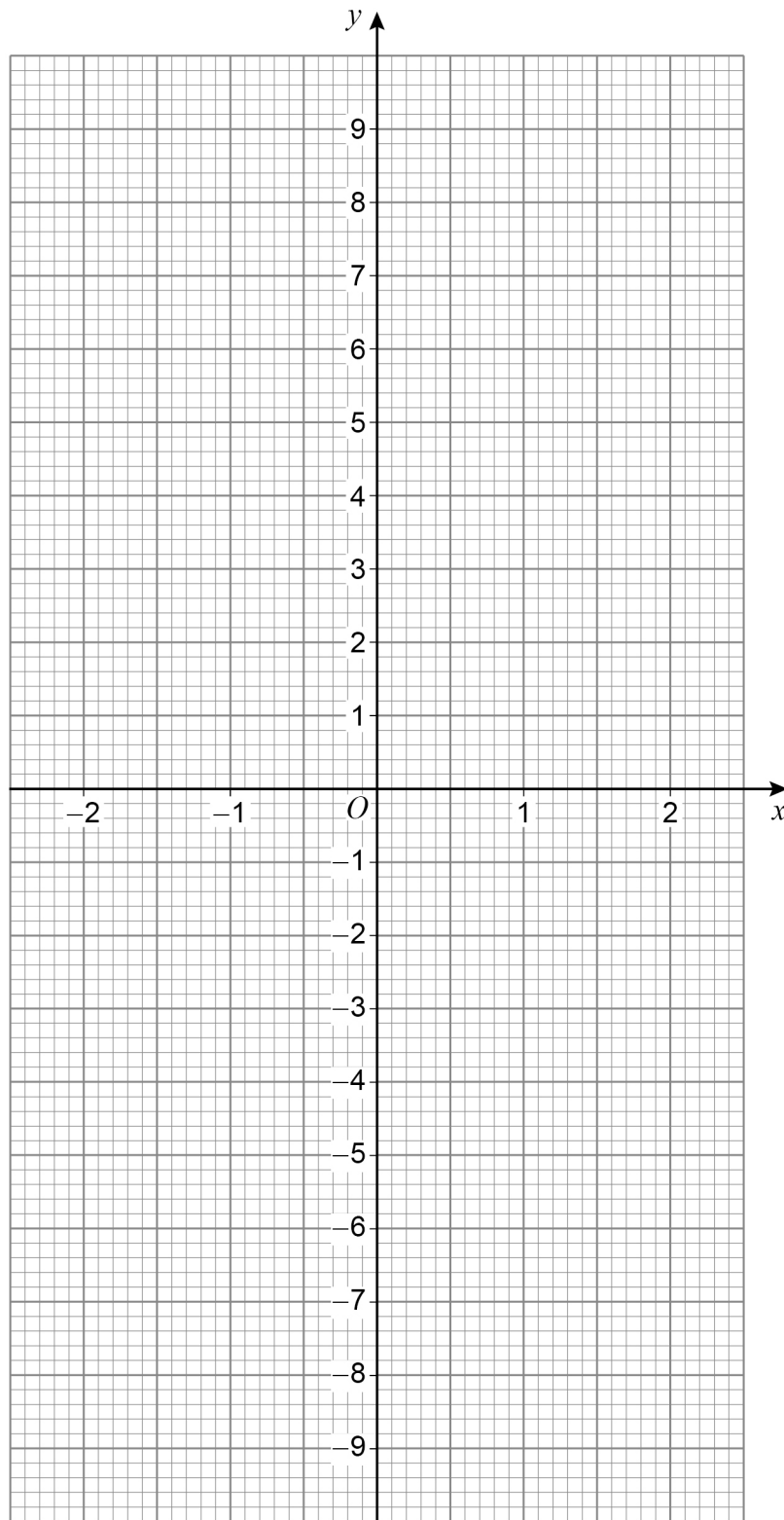
For each statement, tick the correct box.

[3 marks]

	True	False	Cannot tell
A and B are similar.	☐	☐	☐
C and D are congruent.	☐	☐	☐
C and D are both isosceles.	☐	☐	☐



10

Draw the graph of $y = x^3 + 1$ for values of x from -2 to 2 **[3 marks]****Turn over ►**

- 11** Use approximations to 1 significant figure to estimate the value of $0.103^2 \times 79\,128$
You **must** show your working.

[2 marks]

Answer _____

- 12** One of the interior angles of a polygon is acute.
The sum of the remaining interior angles is 510°
Work out the size of the acute angle.

[2 marks]

Answer _____[°]



13

$$s = ut + \frac{1}{2}at^2$$

$$u = 1.9 \quad t = 3.5 \quad a = -0.4$$

Work out the value of s .

[2 marks]

$$s = \underline{\hspace{10cm}}$$

14

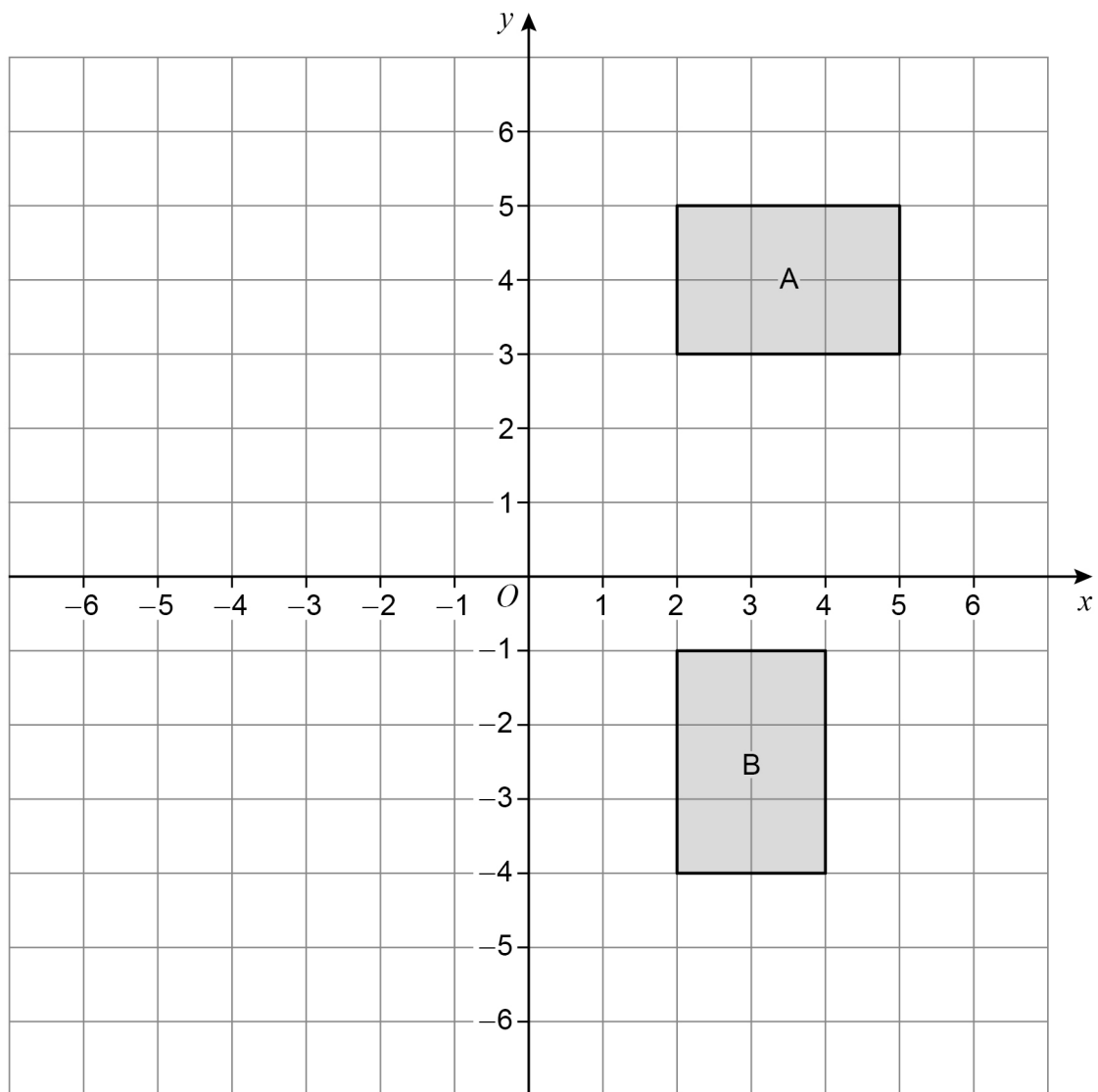
Show that when x is odd and y is even $8x + 5y$ is always even.

[2 marks]



15

Shapes A and B are shown on the grid.

Describe fully the **single** transformation that maps shape A to shape B.**[3 marks]**



16

A football pitch is a rectangle with length 98 m and width 60 m

The area of the pitch is increased by 12.5%

The length of the pitch is increased by 2 m

How much, in metres, is the width of the pitch increased?

[4 marks]

Answer _____ m

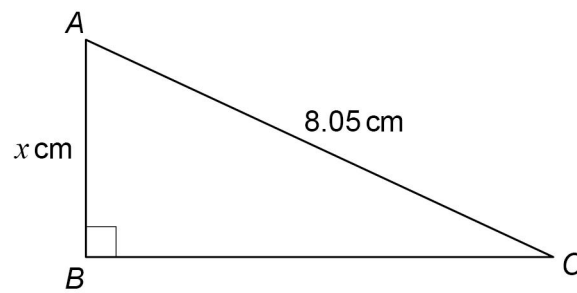
Turn over for the next question

7

Turn over ►



17

 ABC is a right-angled triangle. BC is twice the length of AB .Not drawn
accuratelyWork out the value of x .**[3 marks]**

 $x =$ _____

18 Simplify $\frac{2^{14} \times 2^{-5}}{2^{-4}}$

Give your answer in the form 2^k where k is an integer.

[2 marks]

Answer _____

19 The length of a line is 40 cm to 2 significant figures.

Circle the upper bound of the length.

[1 mark]

40.49 cm

40.5 cm

44.49 cm

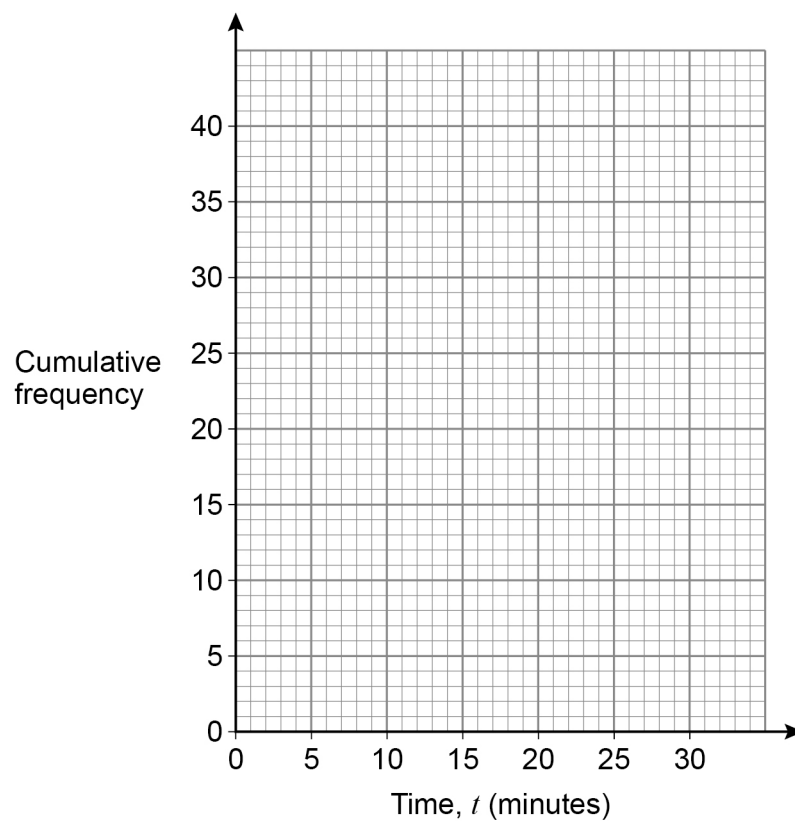
45 cm



20

Information about waiting times for 40 people for a ride at a theme park is shown.

Time, t (minutes)	Cumulative frequency
$t \leq 5$	2
$t \leq 10$	9
$t \leq 15$	19
$t \leq 20$	33
$t \leq 25$	37
$t \leq 30$	40

20 (a) Draw a cumulative frequency diagram for this information.**[2 marks]**

20 (b) Estimate the number of people who waited **more** than 22 minutes.

[2 marks]

Answer _____

20 (c) Estimate the interquartile range.

[2 marks]

Answer _____ minutes

21 Work out $\begin{pmatrix} 3 & 1 \\ 2 & 0 \end{pmatrix} \begin{pmatrix} 4 \\ 5 \end{pmatrix}$

Circle your answer.

[1 mark]

$$\begin{pmatrix} 22 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} 12 & 4 \\ 10 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 17 \\ 8 \end{pmatrix}$$

$$\begin{pmatrix} 12 & 5 \\ 8 & 0 \end{pmatrix}$$



- 22** Two different integers are greater than 10
The two integers have
highest common factor = 9
lowest common multiple = 108

Work out the two integers.

[2 marks]

Answer _____ and _____

- 23** Differentiate $\frac{x^5 + 7x^8}{x^3}$

[3 marks]

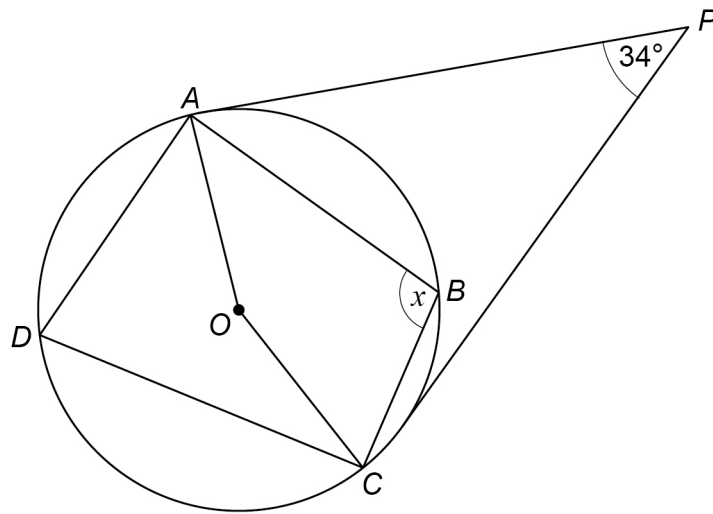
Answer _____



24

A , B , C and D are points on a circle, centre O .

PA and PC are tangents.



Not drawn
accurately

Work out the size of angle x .

[3 marks]

$x =$ _____ $^{\circ}$



- 25** V is directly proportional to h^3
 $V = 2500$ when $h = 10$

- 25 (a)** Work out an equation connecting V and h .

[3 marks]

Answer _____

- 25 (b)** Work out the value of h when $V = 1280$

[2 marks]

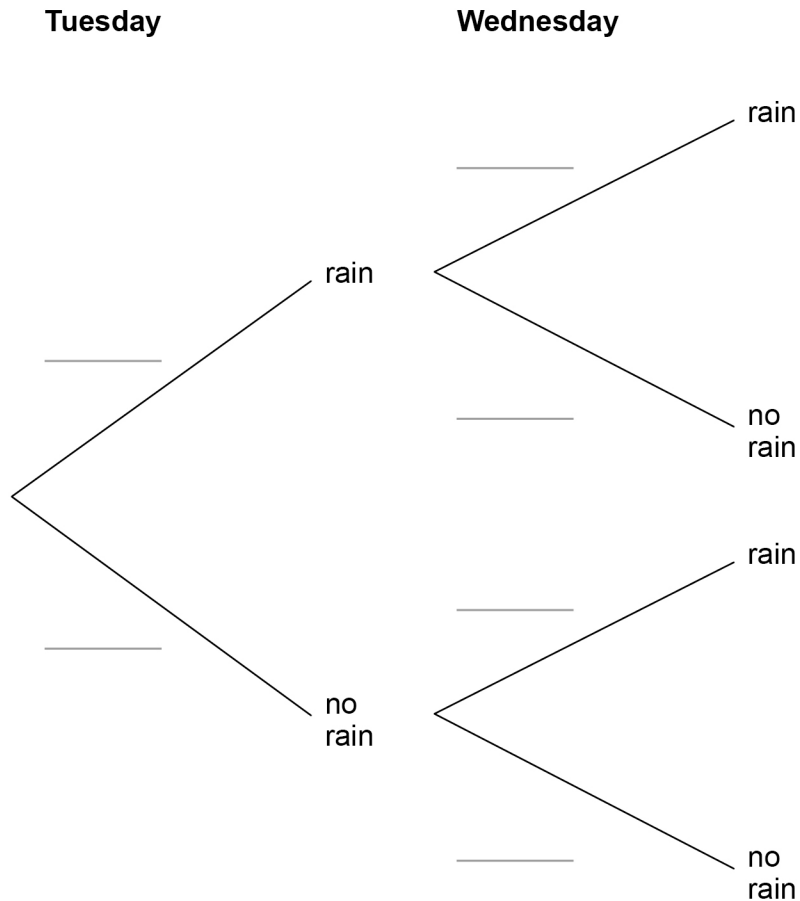
$h =$ _____



- 26** If it rains one day, the probability that it will rain the next day is 0.7
If it does **not** rain, the probability that it will rain the next day is 0.2
It rains on Monday.

- 26 (a)** Complete the tree diagram to show the probabilities for Tuesday and Wednesday.

[2 marks]



- 26 (b)** Work out the probability that it rains on **exactly** one of the days, Tuesday or Wednesday.

[3 marks]

Answer _____



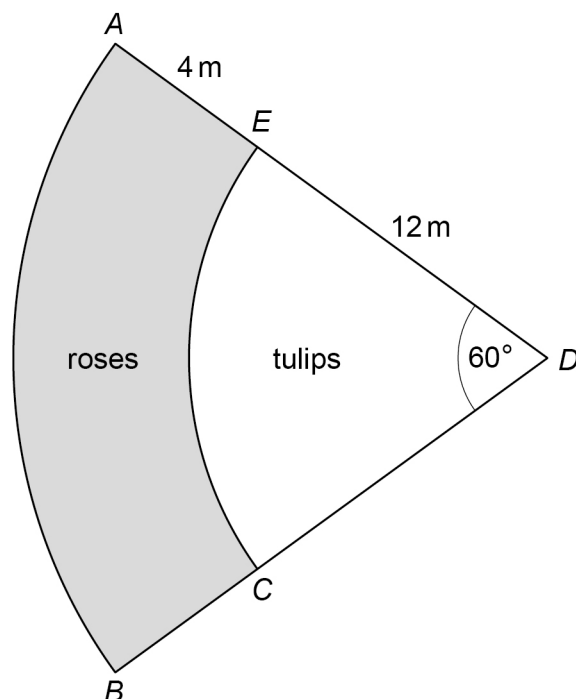
27

Flower bed ABD is a sector of a circle.

The flower bed is divided into two sections.

Sector CDE is used for tulips.

The rest of the flower bed is used for roses.



Not drawn
accurately

Work out the perimeter, in metres, of the section used for **roses**.

Give your answer in the form $\frac{a}{3}\pi + b$ where a and b are integers.

[3 marks]

Answer _____ m



28

Rearrange $y = \sqrt{\frac{3x}{2x-1}}$ to make x the subject.

[4 marks]

Answer _____

29

Circle the fraction equivalent to $\frac{1}{b\sqrt{c}}$

[1 mark]

$$\frac{b - \sqrt{c}}{b^2 - c^2}$$

$$\frac{b + \sqrt{c}}{b^2 - c^2}$$

$$\frac{\sqrt{b}}{bc}$$

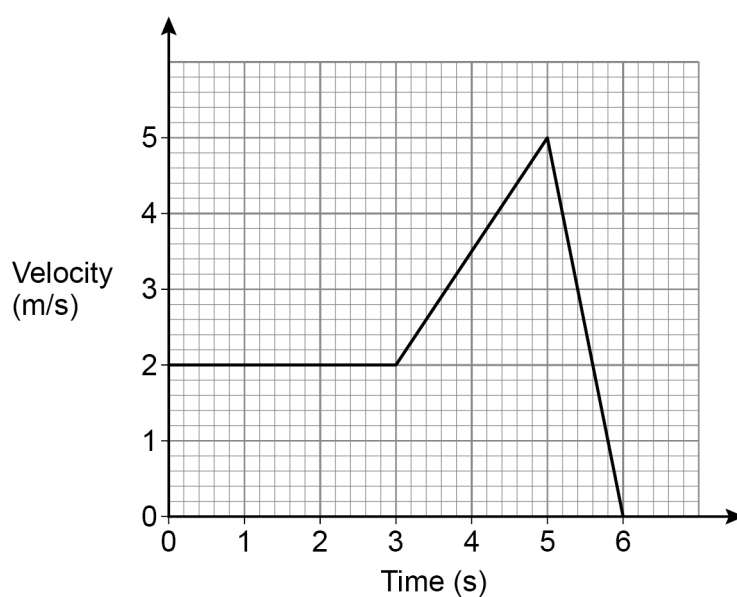
$$\frac{\sqrt{c}}{bc}$$

Turn over ►



30

Here is a velocity-time graph.



- 30 (a)** Work out the acceleration, in m/s^2 , between 3 seconds and 5 seconds.
Circle your answer.

[1 mark]

$\frac{5}{2}$

$\frac{2}{5}$

$\frac{3}{2}$

$\frac{2}{3}$

- 30 (b)** Work out the total distance travelled.

[3 marks]

Answer _____ m



31 Show that $\frac{8+3\sqrt{5}}{2+\sqrt{5}}$ can be written in the form $a+b\sqrt{5}$

where a and b are integers.

[4 marks]

Turn over for the next question

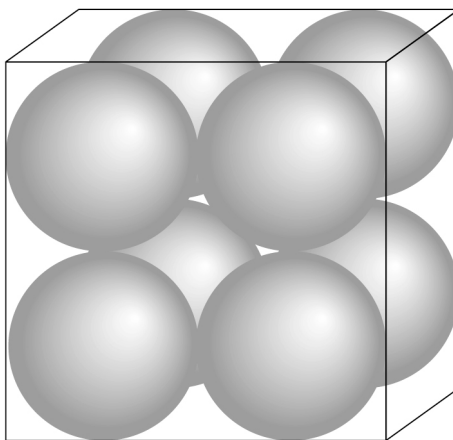
Turn over ►



32

A sphere has a volume of $\frac{243}{16}\pi \text{ cm}^3$

Eight of these spheres just fit into a cube.



Volume of a sphere = $\frac{4}{3}\pi r^3$ where r is the radius

Work out the volume of the cube.

[5 marks]

Answer _____ cm^3



33 Simplify fully $\frac{x^2 - 25}{2x^2 - 7x - 15}$

[3 marks]

Answer _____

34 Each year,
the height of a tree increases by $\frac{1}{8}$ of its height at the start of the year.

At the end of 2020 the height was 10.5 metres.

What was the height at the end of 2017?

[3 marks]

Answer _____ m



The table shows how many books it sold over the next two days.

	Hardback	Paperback
Day 1	36	11
Day 2	9	27

hardback books remaining : paperback books remaining

At the **end** of Day 2, the ratio was 5 : 2

[4 marks]

[illegible]

Answer _____ :

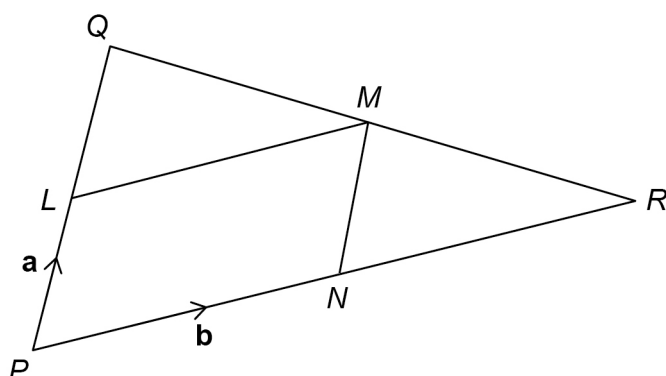


36

 PQR is a triangle. L , M and N are the midpoints of PQ , QR and PR respectively.

$$\overrightarrow{PL} = \mathbf{a}$$

$$\overrightarrow{PN} = \mathbf{b}$$

Not drawn
accuratelyProve that $PLMN$ is a parallelogram.**[3 marks]**

END OF QUESTIONS

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3 2



2 2 B Y 9 2 6 0 / 2 E

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