AQA

NEW PRACTICE PAPER SET 1
Published September 2015

Please write clearly, in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 1 Non-Calculator

Exam Date Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- mathematical instruments

You must **not** use a calculator.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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.
- 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.

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

1 (a) Circle the smallest number.

[1 mark]

2.31 $2.\dot{3}$ 2.33 2.301

1 (b) Circle the largest number.

[1 mark]

7.1 $7.\dot{1}$ 7.11 7.101

2 Here is a sequence.

40 35 30 25 20

Circle the expression for the nth term of the sequence.

[1 mark]

$5n + 35$ $5n - 45$ $45 - 5n$ $n - 5$

3 Which of these is **not** a square number?

Circle your answer.

[1 mark]

4×10^2 4×10^6 9×10^3 9×10^4

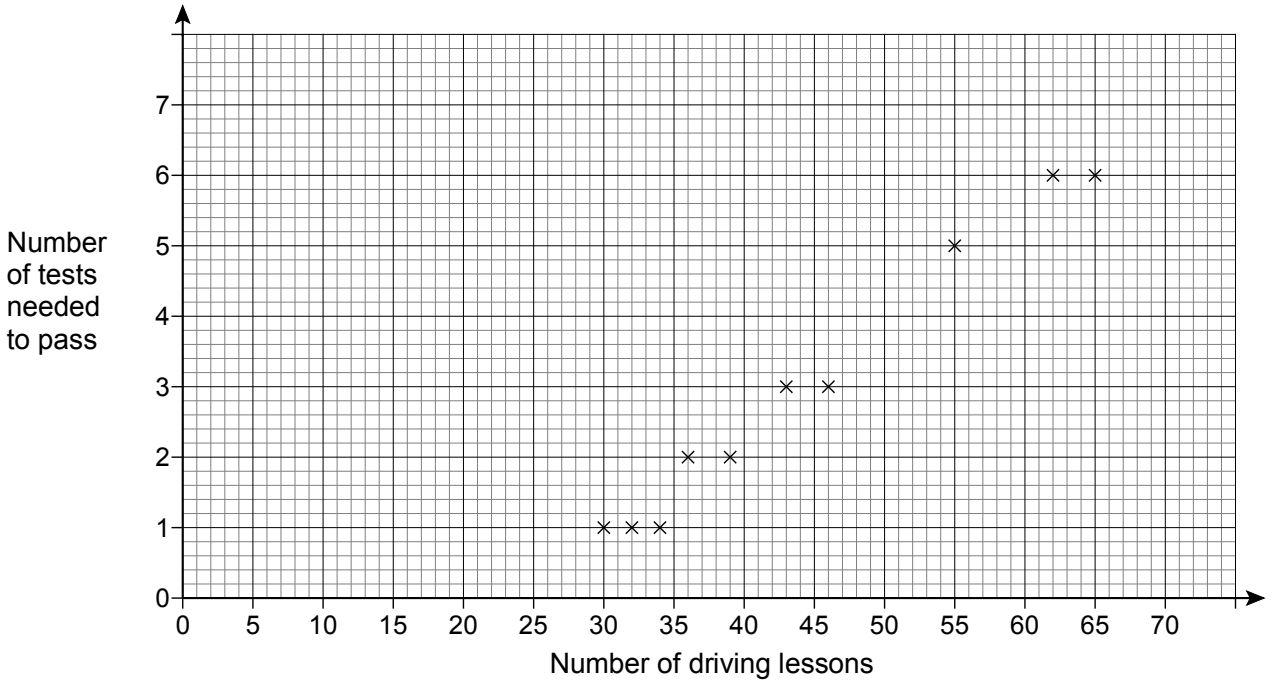
4 Work out $64.32 \div 0.12$

[2 marks]

Answer _____

Turn over for the next question

5 The scatter graph shows the number of driving lessons and the number of tests needed to pass by 10 people.



5 (a) Describe the correlation.

Circle your answer.

[1 mark]

strong positive weak positive weak negative strong negative

5 (b) Use a line of best fit to estimate the number of tests needed to pass by a person who has 50 lessons.

[2 marks]

Answer _____

5 (c) Meera says,

"I can use the trend to predict the number of driving tests needed to pass for any number of driving lessons."

Comment on her statement.

[1 mark]

6 Which of $\frac{2}{5}$ or $\frac{5}{8}$ is closer in value to $\frac{1}{2}$?

You **must** show your working.

[3 marks]

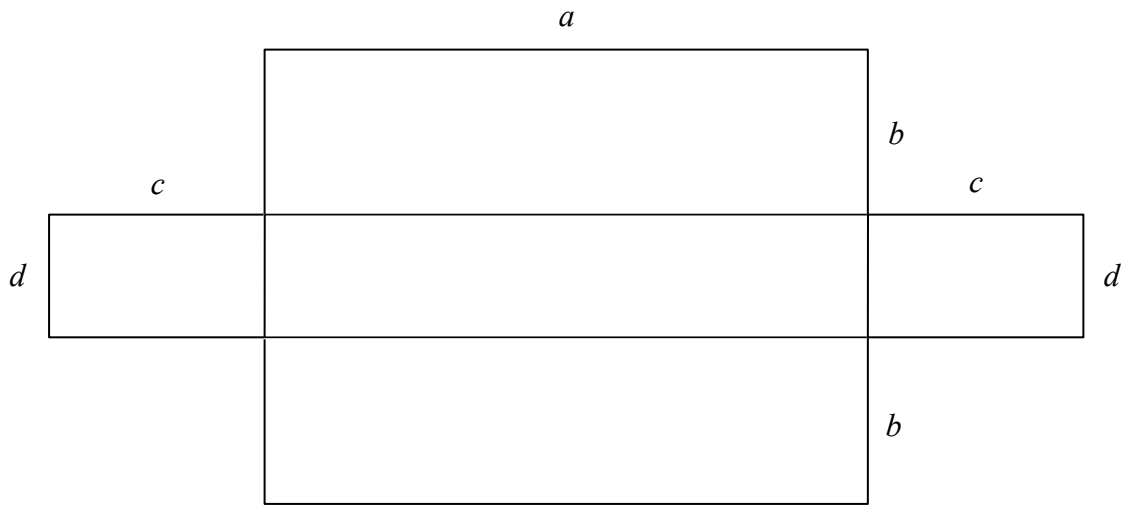
Answer _____

Turn over for the next question

7 A shape is made from rectangles.

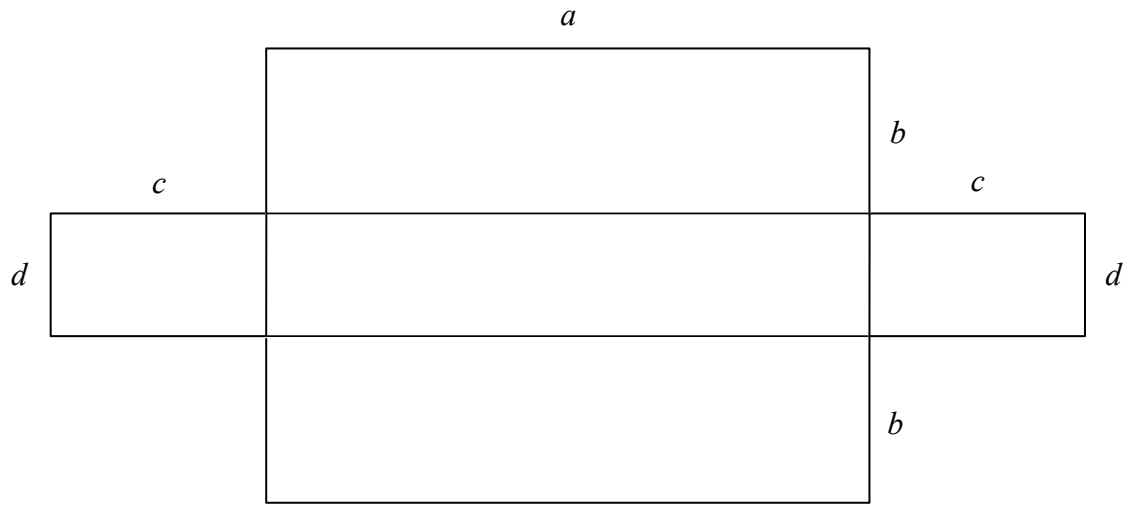
7 (a) On the diagram below shade an area represented by the expression $ad + cd$

[1 mark]



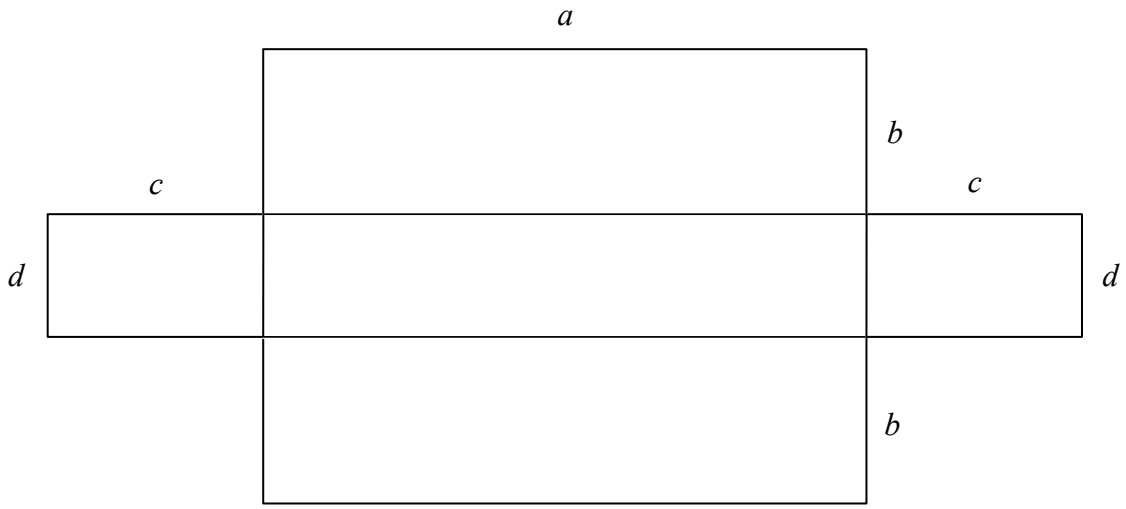
7 (b) On the diagram below shade the area represented by the expression $d(a + 2c)$

[1 mark]



7 (c) Write down an expression for the area of the whole shape.

[1 mark]



Answer _____

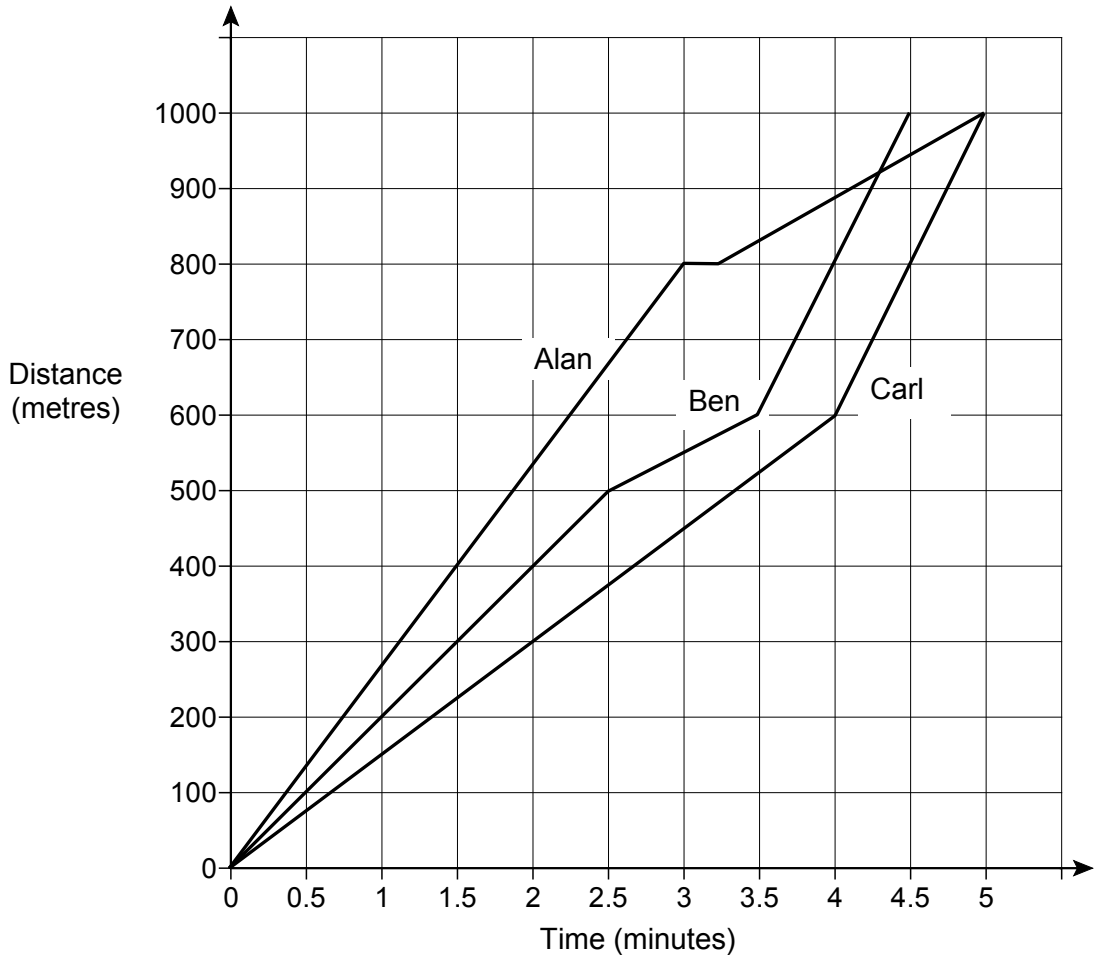
8 Circle the value of cos 30°

[1 mark]

$\frac{1}{\sqrt{3}}$ $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ $\frac{2}{\sqrt{3}}$

9 Alan, Ben and Carl ran a 1000 metre race.

The distance-time graph shows the race.



9 (a) Who won the race?

Give a reason for your answer.

[1 mark]

Answer _____

Reason

_____

_____

9 (b) Describe the race.

[4 marks]

Turn over for the next question

10 $2x + 3y = 15.5$

$x + y = 6$

Work out the values of x and y.

[3 marks]

$x =$ _____

$y =$ _____

11 Five integers have

a mode of 6
a median of 8
a mean of 10

What is the **greatest** possible range of the five integers?

You **must** show your working.

[3 marks]

Answer _____

12 Write $2(7x + 4) - 4(x + 6) + 1$ in the form $a(bx + c)$

where a, b and c are integers and $a > 1$

[3 marks]

Answer _____

Turn over for the next question

13 Here is a map of France.

Scale: 1 cm represents 80 km

13 (a) Estimate the time it would take to drive from Paris to Marseille.

Assume

- the road is straight
- an average speed of 100 km/h

[4 marks]

Answer _____ hours

13 (b) Comment on how each assumption affects the accuracy of your estimate.

[2 marks]

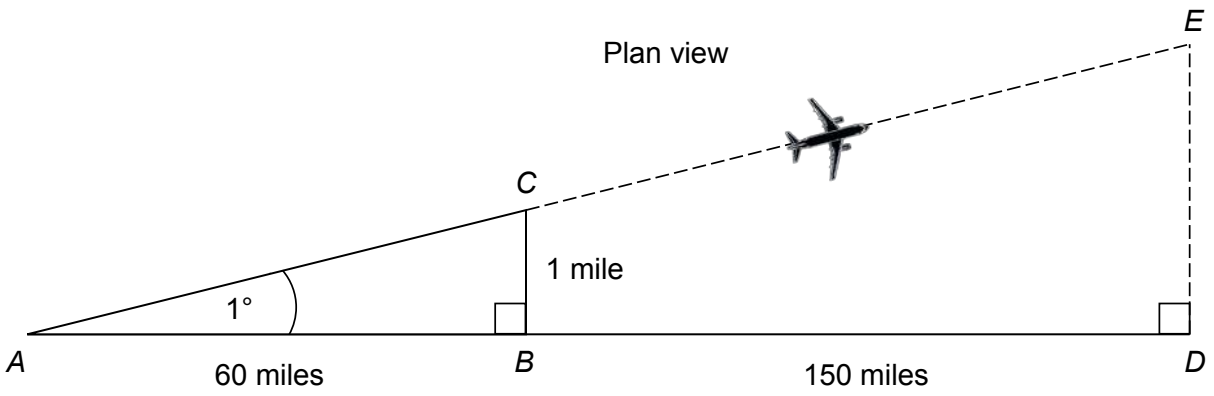
Assumption 1 _____

Assumption 2 _____

14 The pilot of an aircraft wants to fly from *A* to *D*.

The aircraft flies from *A* to *E*, 1° off course.

Not drawn accurately



14 (a) The distance *BC* is 1 mile.

Work out the distance *DE*.

[2 marks]

Answer _____ miles

14 (b) How should the aircraft have turned at *C* to fly directly towards *D*?

Tick a box.

[1 mark]

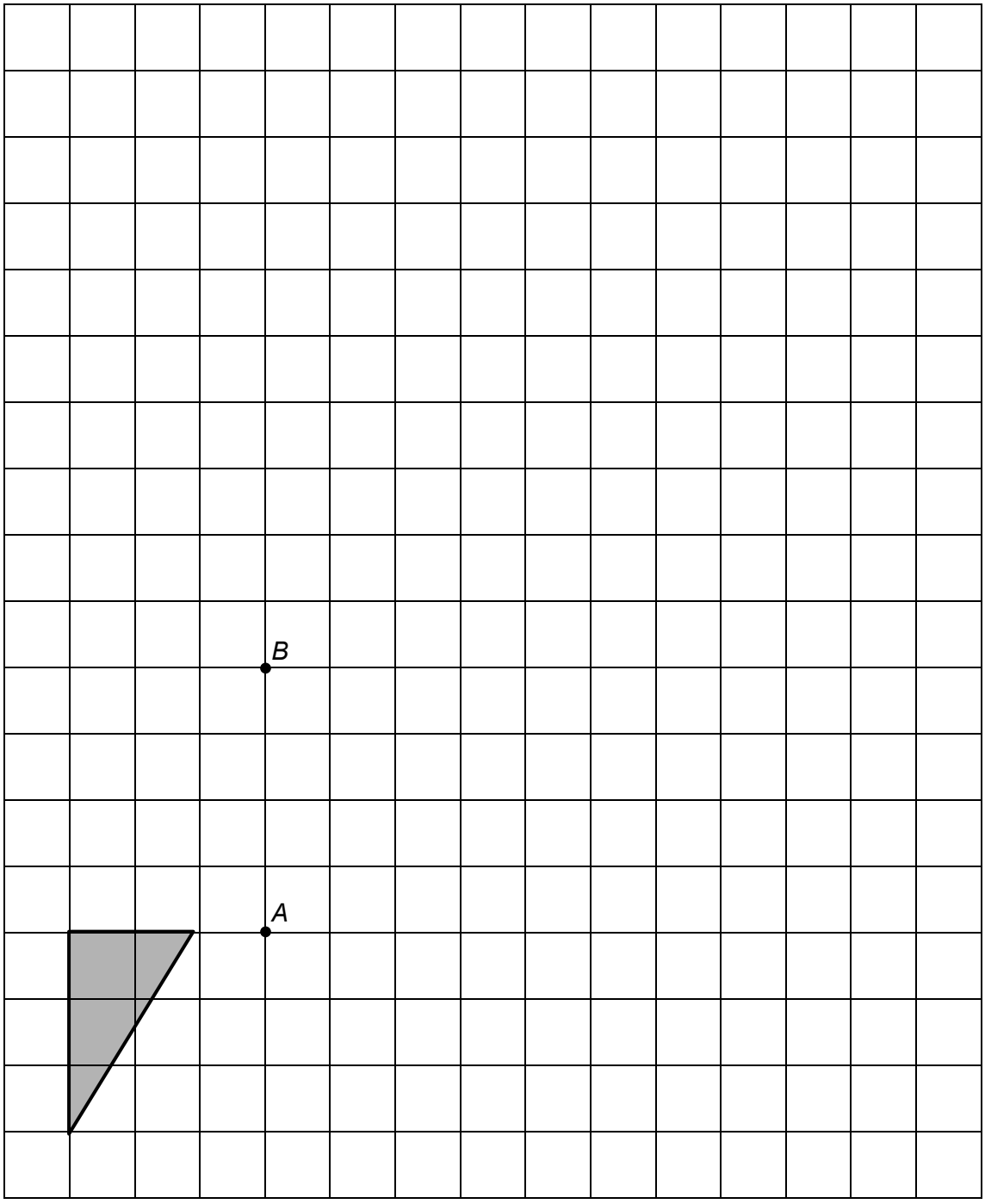
- 1° clockwise ☐
- between 1° and 2° clockwise ☐
- 2° clockwise ☐
- more than 2° clockwise ☐

15 The shape is **rotated** 90° clockwise about point *A*.

It is then **enlarged** by scale factor −2, centre *B*.

Draw the final shape on the diagram.

[3 marks]



16 Rearrange $y = \dfrac{4 - 3x}{x - 5}$ to make x the subject.

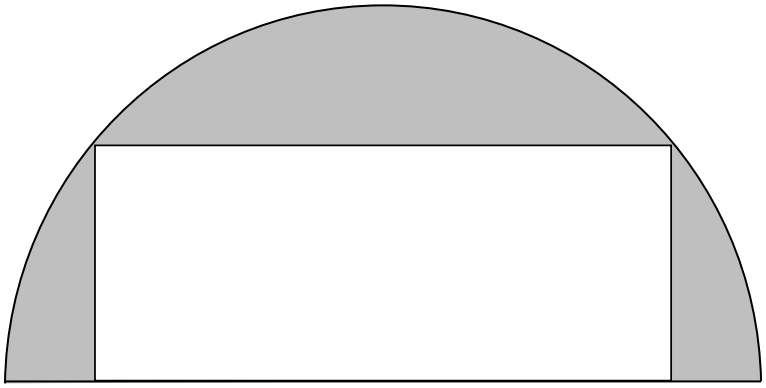
[4 marks]

Answer _____

17 The diagram shows a rectangle inside a semicircle.

The rectangle has dimensions 16 cm by 6 cm

Not drawn accurately



Work out the shaded area.

Give your answer in terms of π.

[4 marks]

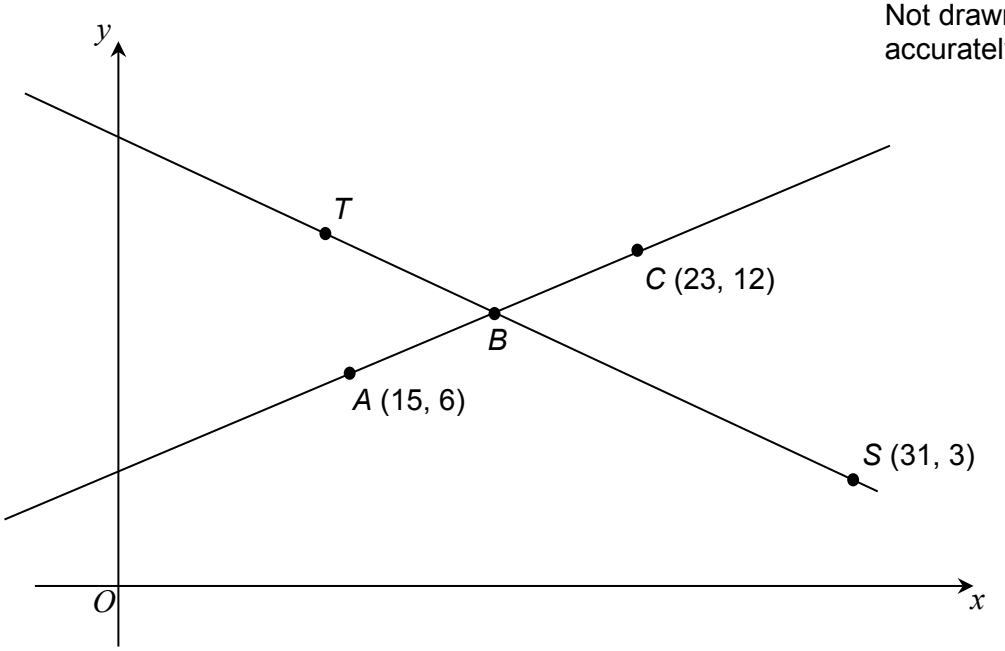
Answer _____ cm^2

18 Two straight lines are shown.

B is the midpoint of *AC*.

TB : *BS* = 2 : 3

Not drawn accurately

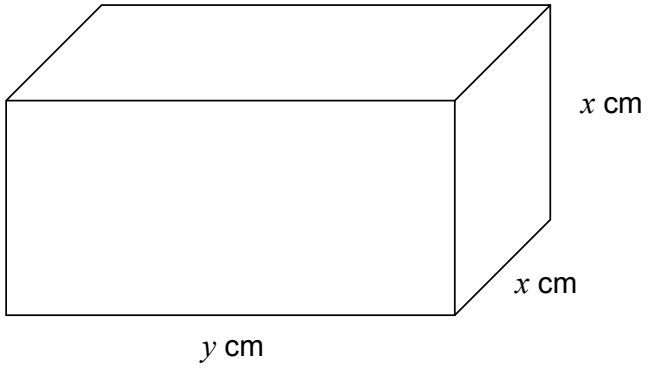


Work out the coordinates of *T*.

[4 marks]

Answer (_____ , _____)

19 A cuboid has dimensions x cm, x cm and y cm



x is increased by 10%

y is decreased by 20%

Work out and describe the percentage change in the volume of the cuboid.

[4 marks]

Answer _____

20 Circle the value of $9^{-\frac{1}{2}}$

[1 mark]

$\frac{1}{81}$ $\frac{1}{3}$ -3 $-4\frac{1}{2}$

21 Expand and simplify $(2x + 5)(2x - 5)(3x + 7)$

[3 marks]

Answer _____

22 Write $\frac{26}{\sqrt{2}} - \frac{12}{\sqrt{18}} + 2\sqrt{50}$ in the form $a\sqrt{2}$ where a is an integer.

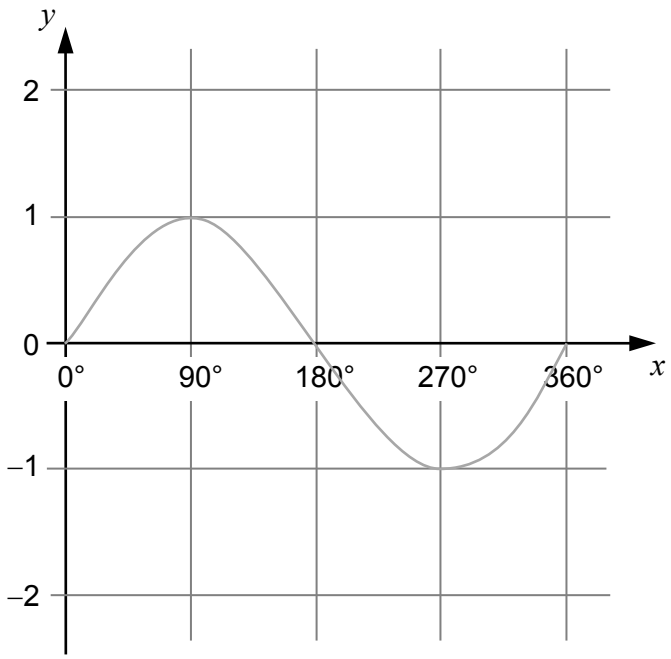
[4 marks]

Answer _____

23 (a) The graph of $y = \sin x$ is shown for $0° \leqslant x \leqslant 360°$

On the grid sketch the graph of $y = \sin x - 1$ for $0° \leqslant x \leqslant 360°$

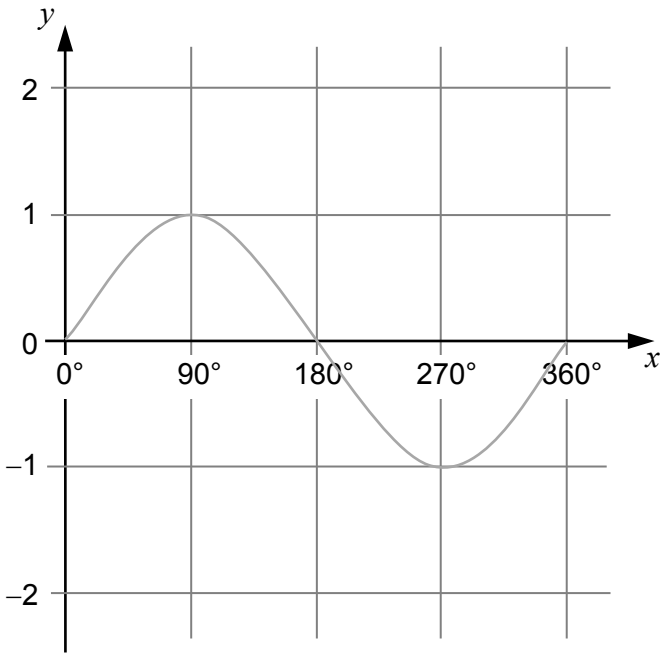
[1 mark]



23 (b) The graph of $y = \sin x$ is shown on the grid for $0° \leqslant x \leqslant 360°$

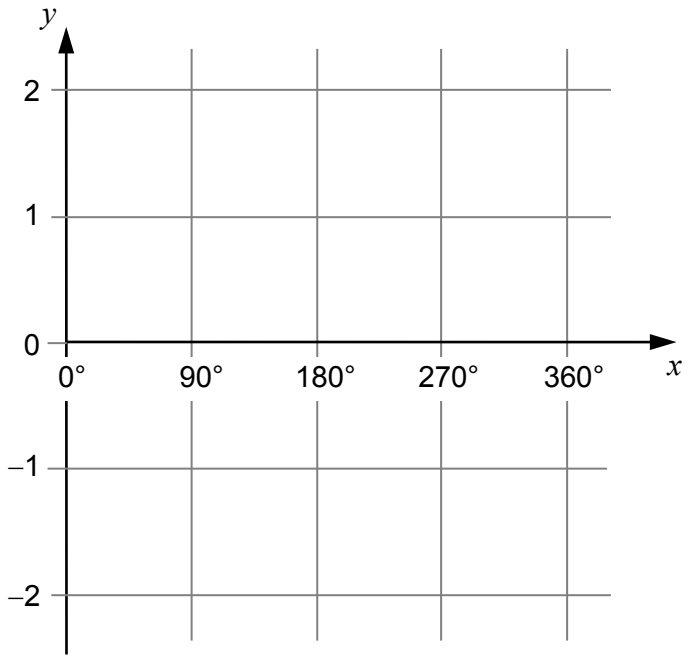
On this grid sketch the graph of $y = -\sin x$ for $0° \leqslant x \leqslant 360°$

[1 mark]



23 (c) On this grid sketch the graph of $y = \tan x$ for $0° \leqslant x \leqslant 360°$

[1 mark]



Turn over for the next question

24 A bag contains n beads.

One bead is black and the rest are white.

Two beads are taken from the bag at random.

24 (a) Show that the probability that **both** beads are white is $\frac{n-2}{n}$

[2 marks]

24 (b) The probability that **both** beads are white is greater than 0.9

Work out the **least** possible value of n.

[3 marks]

Answer _____

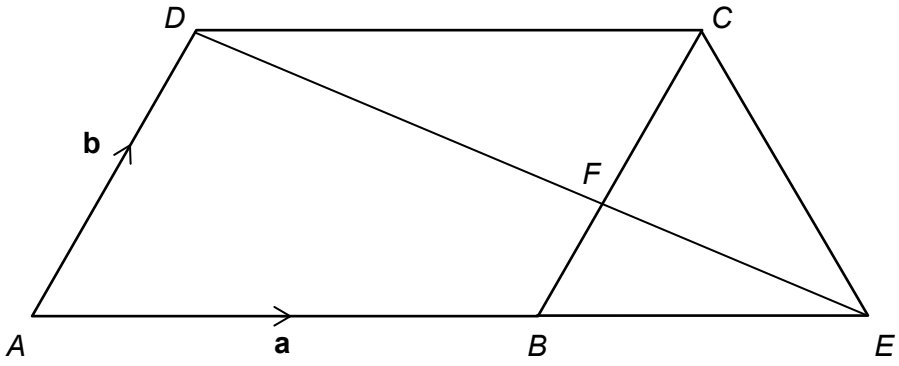
25 *ABCD* is a parallelogram.

ABE is a straight line and $AB : BE = 3 : 2$

BC and *ED* intersect at *F.*

$\overrightarrow{AB} = \mathbf{a}$ and $\overrightarrow{AD} = \mathbf{b}$

Not drawn accurately



25 (a) Work out $\overrightarrow{ED}$ in terms of **a** and **b**.

Give your answer in its simplest form.

[3 marks]

Answer _____

25 (b) Deduce $\overrightarrow{EF}$ in terms of **a** and **b**.

[2 marks]

Answer _____

END OF QUESTIONS

There are no questions printed on this page

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