



Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

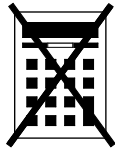
Foundation Tier Paper 1 Non-Calculator

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments
- the Formulae Sheet (enclosed).



You must **not** use a calculator.

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.

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	
TOTAL	

Advice

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



JUN2283001F01

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

- 1 (a) Circle the answer to $150 \div 5 = 30$ [1 mark]

3 30 300 3000

(Handwritten: 30 is circled in blue, 3000 is circled in red)

- 1 (b) Circle the answer to $5 - 7 = -2$ [1 mark]

-12 -2 2 12

(Handwritten: -2 is circled in blue, 12 is circled in red)

- 1 (c) Circle the answer to $-3 \times 3 = -9$ [1 mark]

-9 -6 6 9

(Handwritten: -9 is circled in blue, -6 is circled in red)



- 2 P is double r .
Circle the correct formula.

[1 mark]

$$P = \frac{r}{2}$$

$$P = r + 2$$

$$P = r - 2$$

$$P = 2r$$



- 3 By rounding each number to the nearest 10, estimate the value of 31×18

[3 marks]

$$30 \times 20 = 600$$



Answer 600

Turn over for the next question

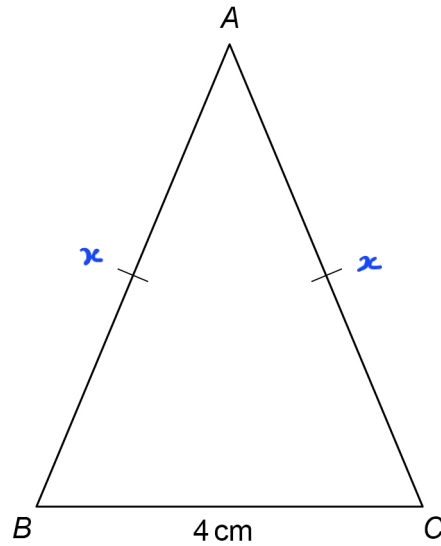
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4

In this isosceles triangle,

$$AB = AC$$

Not drawn
accurately

The perimeter of the triangle is 22 cm

Work out the length of AB.

[3 marks]

$$2x + 4 = 22$$

$$2x = 18 \quad (1)$$

$$x = \frac{18}{2} \quad (1)$$

$$x = 9 \quad (1)$$

Answer 9 cm

5

After school, Priya will

- go running (R)
- do her homework (H)
- play a video game (V).

Complete the list of the 6 possible orders in which she could do them.

[2 marks]

RHV
RVH
HRV
HVR
VHR
VRH

2

Turn over for the next question

5

Turn over ►



6 (a) Which statement is correct?

Tick **one** box.

$$20 < 19$$

$$17 + 3 < 29 - 10$$

$$20 = 19$$

$$17 + 3 = 29 - 10$$

$$20 > 19$$

$$17 + 3 > 29 - 10$$

①

Show working to support your answer.

[2 marks]

$$17 + 3 = 20, \quad 29 - 10 = 19 \quad \text{①}$$

$$20 > 19$$

6 (b) Work out $60 \div 2 + 4$

[2 marks]

$$= \frac{60}{2} + 4$$

$$= 30 + 4$$

$$= 34$$

Answer 34 ②



7

	Cost of 100 grams
Cereal	49p
Pasta	14p

Leah buys 400 grams of cereal and 250 grams of pasta.

Work out the **total** cost in £

[4 marks]

$$\text{cereals : } 49\text{p} \times \frac{400}{100} = 196\text{ p}$$

(1)

(1)

$$\text{pasta : } 14\text{p} \times \frac{250}{100} = 35\text{ p}$$

$$\text{Total : } 196\text{ p} + 35\text{ p} = 231\text{ p} \quad (1)$$

$$= \text{£ } 2.31 \quad (1)$$

Answer £ 2.31

Turn over for the next question

Turn over ►



- 8 (a) For a set of five numbers,
the mode is 8
the median is 12

Work out **one** possible set of five numbers.

[2 marks]

third number = 12

first and second number = 8

Answer 8 8 12 13 14
(2)

- 8 (b) Here are the heights, in centimetres, of some children.

98 103 91 85 159 102 91

Which height is an outlier?

[1 mark]

Answer 159 (1) cm



9 Shona has 14 dresses.

50% of these dresses are red.

She gives 5 of her red dresses to a charity shop.

She buys 1 new red dress.

What percentage of the dresses she has now are red?

[4 marks]

$$\text{red} = \frac{50}{100} \times 14 = 7 \quad (1)$$

$$7 - 5 = 2 \text{ left}$$

$$2 + 1 = 3 \quad (1)$$

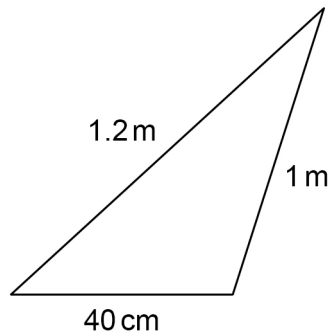
$$\text{percentages} = \frac{3}{14 - 5 + 1} \times 100 = \frac{3}{10} \times 100 = 30\% \quad (1)$$

Answer 30 (1) %

Turn over for the next question



10 (a) Here is a triangle.



Not drawn
accurately

Work out $\frac{\text{length of shortest side}}{\text{length of longest side}}$

Give your answer as a fraction in its simplest form.

[2 marks]

$$1.2 \text{ m} \times 100 = 120 \text{ cm}$$

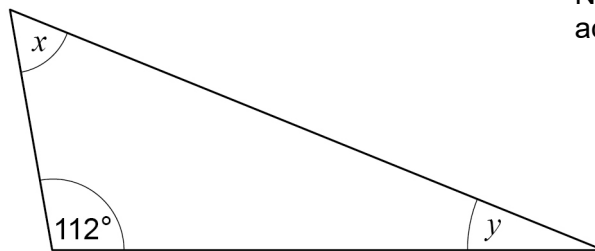
$$1 \text{ m} \times 100 = 100 \text{ cm}$$

$$\frac{40 \text{ cm}}{120 \text{ cm}} = \frac{4}{12} = \frac{1}{3}$$

Answer $\frac{1}{3}$ (2)



10 (b) Here is a different triangle.



Not drawn
accurately

$$x = 3y$$

Work out the size of angle y .

[3 marks]

$$x + y + 112^\circ = 180^\circ$$

$$3y + y = 180^\circ - 112^\circ \quad (1)$$

$$4y = 68^\circ \quad (1)$$

$$y = 17^\circ$$

$$y = \underline{17} \quad (1) \quad ^\circ$$

Turn over for the next question

Turn over ►



- 11 Companies A and B sell insurance for mobile phones.
The table shows the **monthly** costs for two types of cover, Damage and Loss.

Company	Damage	Loss
A	£8.65	£12.20
B	£7.25	£14.10

- 11 (a) Work out the difference in monthly cost for the two types of cover with **Company A**.

[2 marks]

$$12.20 - 8.65 = 3.55$$

①

①

Answer £ 3.55



11 (b) Ben wants Damage cover with **Company B**.

How much in total will he pay for one year?

[3 marks]

$$\text{monthly : } 7.25 \quad (1)$$

$$\text{yearly : } 7.25 \times 12$$

$$= 87.00 \quad (1)$$

Answer £ 87

12

Work out $\frac{11}{18} - \frac{1 \times 6}{3 \times 6}$

[2 marks]

$$\frac{11}{18} - \frac{6}{18} = \frac{5}{18} \quad (1)$$

Answer $\frac{5}{18}$

7

Turn over ►



- 13 (a) The term-to-term rule for a sequence is

multiply by 2

The 3rd term of the sequence is 46

Work out the 1st term.

Give your answer as a decimal.

[3 marks]

$$\text{let 1st term} = x$$

$$\text{2nd term} = 2x$$

$$\text{3rd term} = 4x$$

$$4x = 46 \quad (1)$$

$$x = \frac{46}{4} = 11.5 \quad (1) \quad (1)$$

Answer 11.5

- 13 (b) The term-to-term rule for a different sequence is

subtract k

The 1st term is 34

The 4th term is 10

Work out the value of k .

[3 marks]

$$\text{1st term} = 34$$

$$\text{2nd term} = 34 - k \quad (1)$$

$$\text{3rd term} = 34 - 2k$$

$$\text{4th term} = 34 - 3k = 10$$

$$3k = 34 - 10 = 24 \quad (1)$$

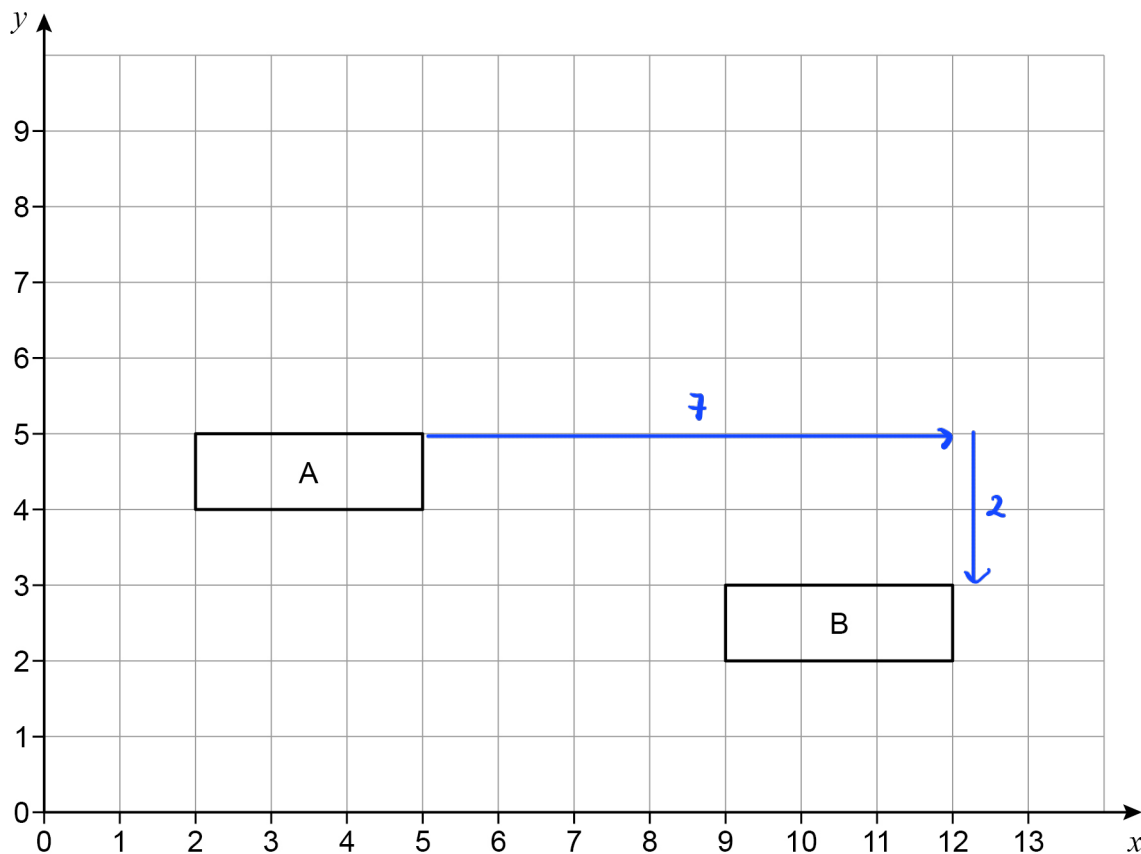
$$k = 8 \quad (1)$$

$k =$ 8



Do not write outside the box

14



Work out the vector that translates shape A to shape B.

[2 marks]

Answer $\begin{pmatrix} 7 \\ -2 \end{pmatrix}$ (2)

Turn over for the next question

Turn over ►



15

In a bag there are only red discs, blue discs and green discs.

There are 10 red discs.

When one disc is picked at random

$$P(\text{red}) = \frac{1}{8}$$

$$P(\text{blue}) = \frac{2}{5}$$

How many **green** discs are in the bag?

[4 marks]

$$\text{Total discs} = \frac{10}{\frac{1}{8}} = 80 \quad (1)$$

$$\text{Total blue} = \frac{2}{5} \times 80 = 32 \quad (1)$$

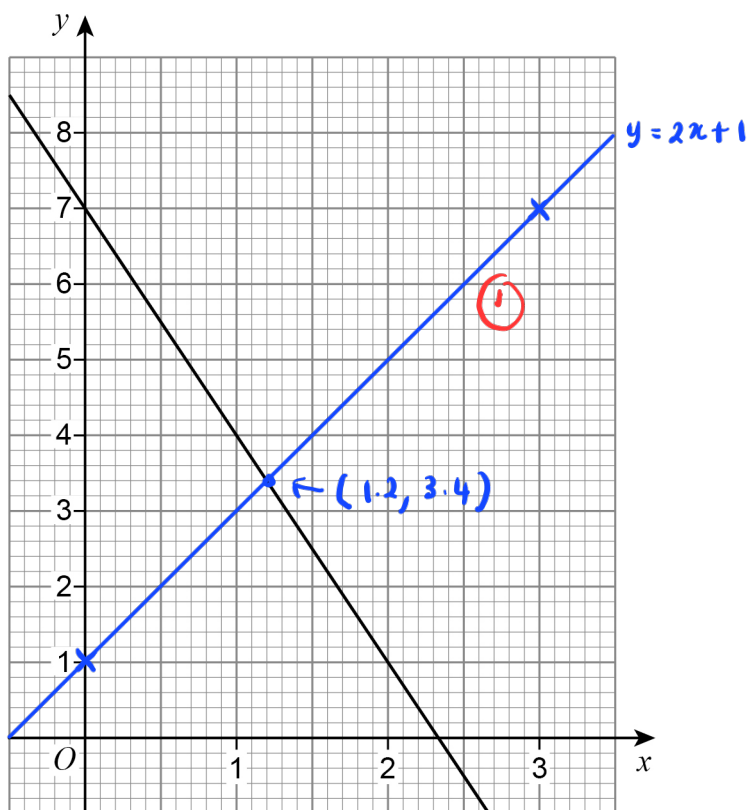
$$\text{Total green} = 80 - 10 - 32 \quad (1)$$

$$= 38 \quad (1)$$

Answer 38



16 Here is the graph of $y = 7 - 3x$



Draw the graph of $y = 2x + 1$ on the grid and then

work out an approximate solution to $7 - 3x = 2x + 1$

[3 marks]

when $x = 0$, $y = 1$ $(0, 1)$ ①

when $x = 3$, $y = 7$ $(3, 7)$

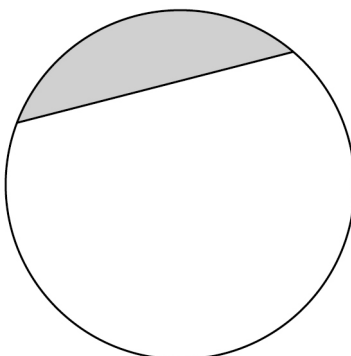
Answer 1.2 ①

7

Turn over ►



17 Part of this circle is shaded.



Circle the name of the shaded part.

[1 mark]

arc

sector

chord

segment

1

18 Work out $80\,000\,000 \div 200$
Give your answer in standard form.

[2 marks]

$$\frac{80\,000\,000}{200} = 400\,000$$

$$= 4 \times 10^5$$

2

Answer 4×10^5



19 (a) Work out $\frac{3^{12}}{3^7}$

Give your answer as a whole number.

[2 marks]

$$3^{12-7} = 3^5$$

$$= 243$$

2

Answer 243

19 (b) Simplify $8 \times 2^6 \times 2^4$

Give your answer as a power of 2

[2 marks]

$$8 = 2^3$$

$$2^3 \times 2^6 \times 2^4$$

$$= 2^{3+6+4} = 2^{13}$$

Answer 2^{13} 2

7

Turn over ►



20

In a group of 98 students

25 study both Art and French

10 study Art but do not study French

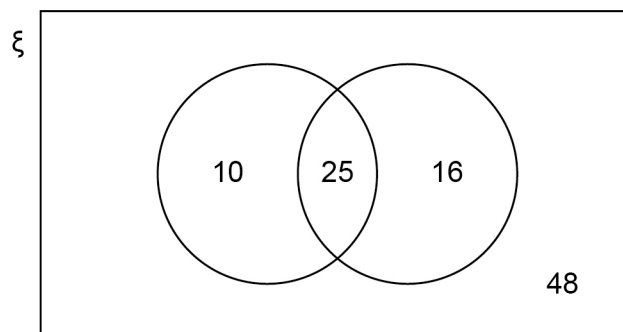
41 study French.

Joel draws this Venn diagram to represent the information.

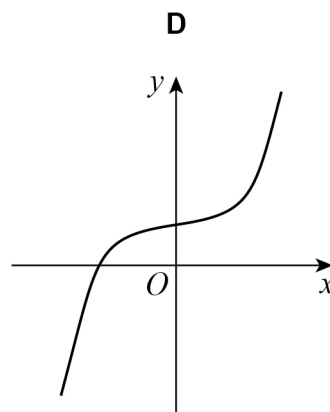
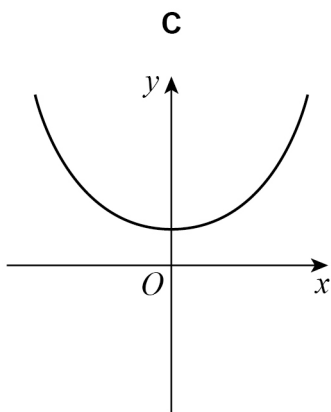
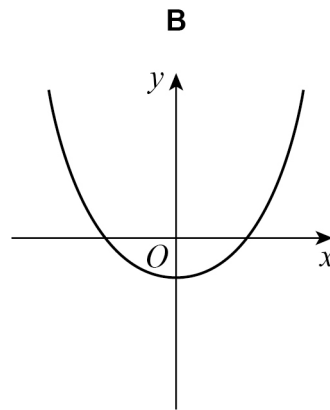
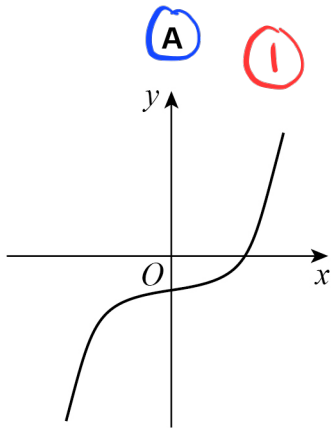
 ξ = the group of 98 students

A = the students who study Art

F = the students who study French

Make **two** criticisms of his diagram.**[2 marks]**Criticism 1 No labels A and F on Venn diagram (1)Criticism 2 Total group is more than 98 (1)

21 Circle the letter of the possible sketch graph of $y = x^3 - 4$ **[1 mark]**
cubic graph with y-intercept = -4



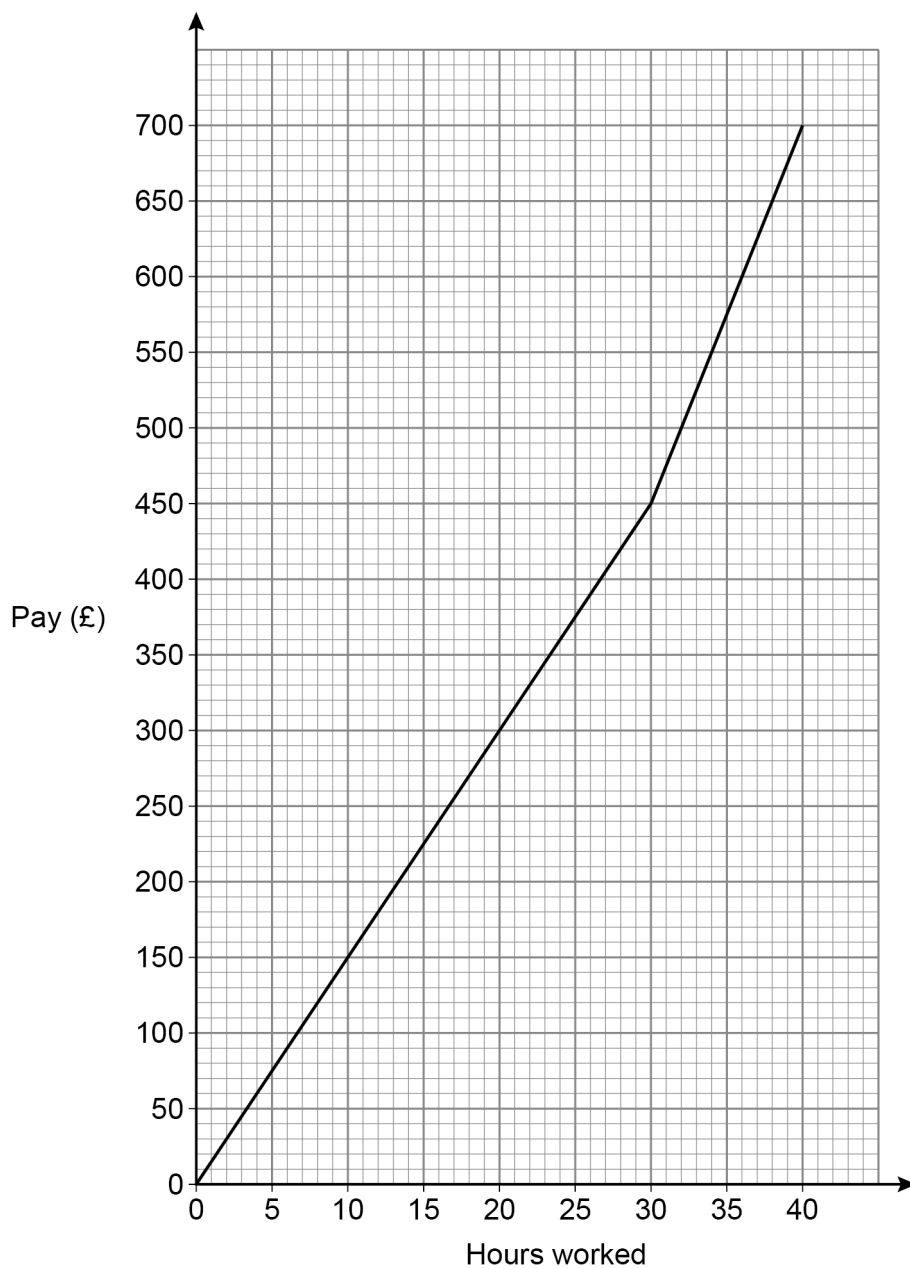
Turn over for the next question



22

In a week, Samir is paid
a basic hourly rate for the first 30 hours worked
an overtime hourly rate for any extra hours worked.

The graph shows his pay for working up to 40 hours in a week.



Work out the ratio basic hourly rate : overtime hourly rate

Give your answer in its simplest form.

[3 marks]

$$\text{Basic hourly rate} = \frac{450}{30} = 15 \text{ (1)}$$

$$\text{Overtime hourly rate} = \frac{(700 - 450)}{40 - 30} = \frac{250}{10} = 25 \text{ (1)}$$

$$\begin{aligned} \text{ratio} &= 15 : 25 \\ &= 3 : 5 \end{aligned} \quad \downarrow \div 5$$

$$\text{Answer } \underline{3} : \underline{5} \text{ (1)}$$

23 (a) In each box, write a fraction **less** than 1 to make a correct calculation.

[1 mark]

$$\boxed{\frac{1}{2}} \times \boxed{\frac{3}{5}} = \frac{3}{10}$$

(1)

23 (b) In each box, write a decimal **less** than 1 to make a correct calculation.

[1 mark]

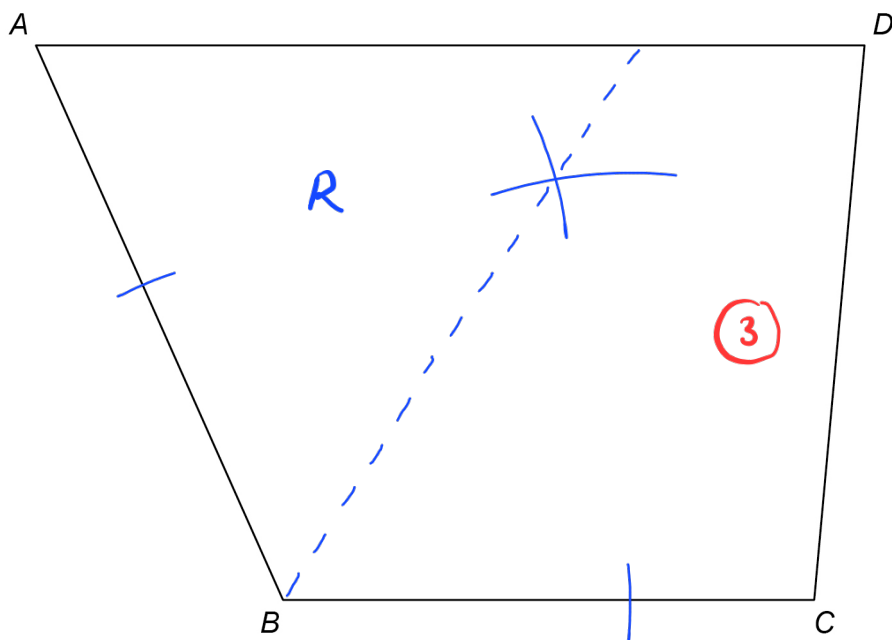
$$\boxed{0.2} \times \boxed{0.3} = 0.06$$

(1)



24 Use a ruler and compasses in this question.

$ABCD$ represents a garden.



A tree is to be planted in the garden.

The tree will be in the region that is closer to AB than to BC .

Label the region, R , where the tree could be planted.

Show all your construction lines.

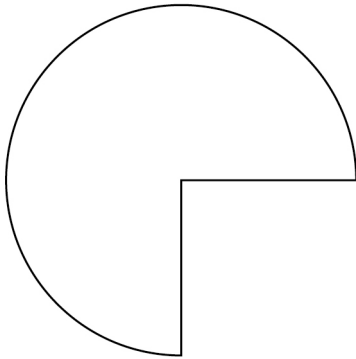
[3 marks]



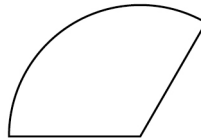
25

Here are two shapes, P and Q.

P
 $\frac{3}{4}$ of a circle, radius 20 cm



Q
 $\frac{1}{3}$ of a circle, radius 15 cm

Not drawn
accurately

How many times bigger is the area of P than the area of Q?

You **must** show your working.

[4 marks]

$$\text{Area of P} : \frac{3}{4} \times (\pi \times 20^2)$$

$$= \frac{3}{4} \times 400 \pi \quad (1)$$

$$= 300 \pi \quad (1)$$

$$\text{Area of Q} : \frac{1}{3} \times (\pi \times 15^2)$$

$$= \frac{1}{3} \times 225 \pi$$

$$= 75 \pi \quad (1)$$

$$\frac{P}{Q} = \frac{300}{75} = 4 \quad (1)$$

Answer _____

4

Turn over ►



26 Solve $\frac{2w}{15} = \frac{4}{5}$

[2 marks]

$$2w = \frac{4}{5} \times 15 \quad (1)$$

$$2w = 12$$

$$w = 6 \quad (1)$$

$$w = \underline{\quad 6 \quad}$$

27 A solid has volume 300 cm^3 and density 2 g/cm^3

Circle the mass of the solid.

[1 mark]

150 g

298 g

302 g

600 g

$$\text{mass} = 300 \times 2 = 600$$

28 $x:y$ is $9:5$

Circle the value of $\frac{2x}{y}$

$$\frac{x}{y} = \frac{9}{5}$$

$$2\left(\frac{9}{5}\right) = \frac{18}{5}$$

[1 mark]

 $\frac{5}{18}$
 $\frac{18}{5} \quad (1)$
 $\frac{9}{10}$ $\frac{10}{9}$

END OF QUESTIONS



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3 2



2 2 6 G 8 3 0 0 / 1 F

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