AQA

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.

Advice

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

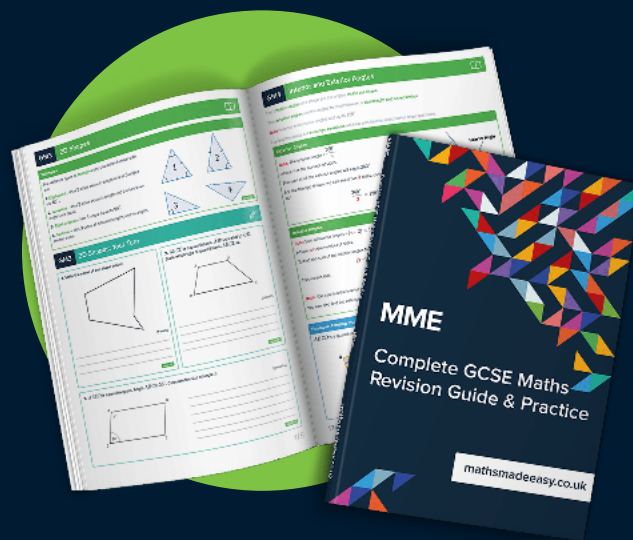| For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
TOTAL	

MME.

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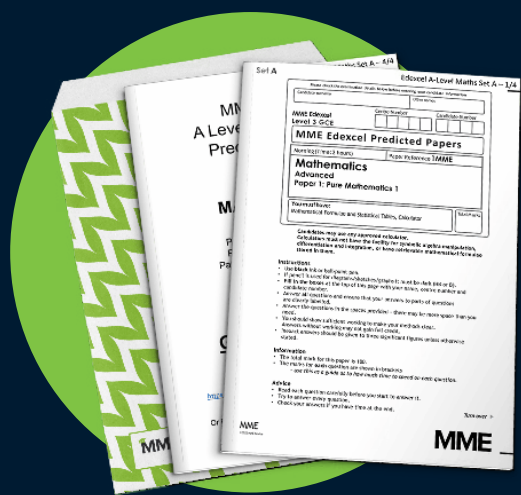
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Answer **all** questions in the spaces provided.

1 (a) Circle the answer to 150 ÷ 5

[1 mark]

3　　　　(30)　　　　300　　　　3000

1 (b) Circle the answer to 5 − 7

[1 mark]

−12　　　　(−2)　　　　2　　　　12

1 (c) Circle the answer to −3 × 3

[1 mark]

(−9)　　　　−6　　　　6　　　　9

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2 P is double r.

Circle the correct formula.

[1 mark]

$$P = \frac{r}{2} \qquad\qquad P = r + 2 \qquad\qquad P = r - 2 \qquad\qquad \boxed{P = 2r}$$

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
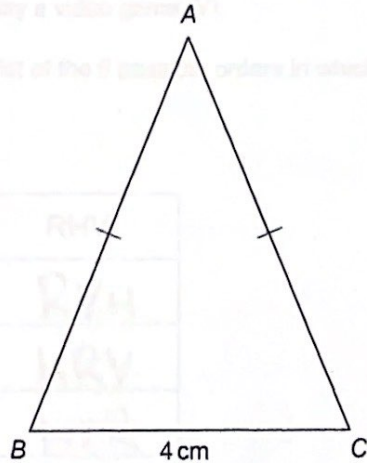
7

Turn over ▶

4 In this isosceles triangle,

$$AB = AC$$

A

Not drawn
accurately

B   4 cm   C

The perimeter of the triangle is 22 cm

Work out the length of *AB*.

[3 marks]

$$AB + AC + 4 = 22, \quad AB = AC$$
$$2AB + 4 = 22$$
$$2AB = 18$$
$$AB = 18 \div 2 = 9 \text{ cm}$$

Answer _____ 9 _____ cm

Turn over for the next question

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

Turn over for the next question

5

Turn over ▶

6 (a) Which statement is correct?

Tick **one** box.

☐ $17 + 3 < 29 - 10$

☐ $17 + 3 = 29 - 10$

☑ $17 + 3 > 29 - 10$

Show working to support your answer.

[2 marks]

$17 + 3 = 20$, $29 - 10 = 19$

$20 > 19$

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

[2 marks]

$60 \div 2 = 30$ BIDMAS.

$60 \div 2 + 4 = 34$.

Answer _____ 34

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]

Cereal: $\dfrac{400 \times 49}{100} = 4 \times 49 = 196p.$

Pasta: $\dfrac{250 \times 14}{100} = 2.5 \times 14 = 35p.$

$\begin{array}{r} 196 \\ + 35 \\ \hline 231p = £2.31 \end{array}$

Answer £ ___2.31___

Turn over for the next question

8

Turn over ▶

Do not write
outside the
box

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]

8 appears the most,
12 is in "the middle" when ordered.

Answer _8_ _8_ _12_ _13_ _14_

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_____ 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]

50% of $14 = 0.5 \times 14 = 7$ red dresses.

Gives away 5 (9 dresses, 2 of them red).
Buys a new red dress (10 dresses, 3 red).
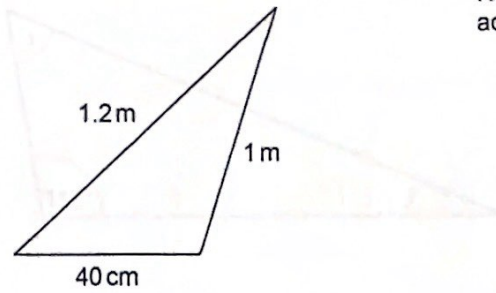
$\frac{3}{10} \times 100 = 30\%$

Answer _____ 30 _____ %

Turn over for the next question

7

Turn over ▶

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10 (a) Here is a triangle.

Not drawn accurately

1.2 m

1 m

40 cm

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

Give your answer as a fraction in its simplest form.

[2 marks]

Shortest side = 40 cm
longest side = 120 cm.
$\dfrac{40}{120} = \dfrac{4}{12} = \dfrac{1}{3}$.

Answer ___ 1/3 ___

IB/M/Jun22/8300/1F

10 (b) Here is a different triangle.

Not drawn
accurately

$x = 3y$
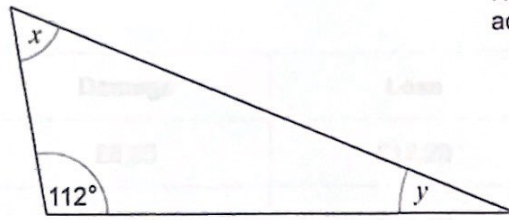
Work out the size of angle y.

[3 marks]

$$180° = 112° + x + y$$
$$180 = 112 + 4y$$
$$4y = 68$$

$$y = 68 \div 4 = 17.$$

$y =$ _____ 17 °

Turn over for the next question

5

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]

$$\begin{array}{r} 1\,2\cdot2\,0 \\ -\ 8\cdot6\,5 \\ \hline £3\cdot5\,5 \end{array}$$

Answer £ ___3.55___

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

How much in total will he pay for one **year**?

[3 marks]

$$7.25 \times 12 = 7.25 \times 10 + 7.25 \times 2$$
$$= 72.5 + 14.5$$
$$= 87$$

£87

Answer £ $\underline{\quad 87 \quad}$

12 Work out $\dfrac{11}{18} - \dfrac{1}{3}$

[2 marks]

$$\frac{1}{3} \xrightarrow{\times 6} \frac{6}{18} \qquad \frac{11}{18} - \frac{6}{18} = \frac{5}{18}$$

Answer $\underline{\quad 5/18 \quad}$

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]

3rd term: 46) ÷2
2nd term: 23) ÷2
1st term: 11.5

Answer ___11·5___

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

subtract k

The 1st term is 34
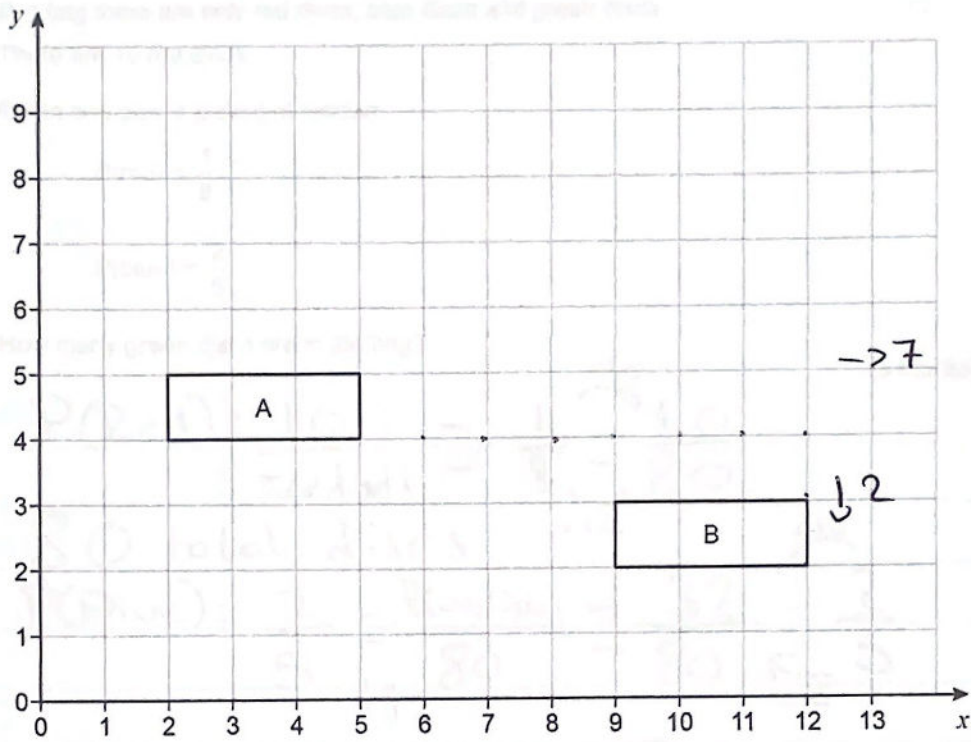
The 4th term is 10

Work out the value of k.

[3 marks]

1st term: 34 $34-10 = 3k$
2nd: $34-k$ $24 = 3k$
3rd: $34-2k$ $k = 8$
4th: $34-3k = 10$

$k=$ ___8___

14

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

[2 marks]

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

Turn over for the next question

8

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

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

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

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

[4 marks]

$P(Red) = \dfrac{10}{Total\ discs} - \dfrac{1}{8} \overset{\times 10}{\curvearrowright} \dfrac{10}{80}.$

80 total discs. $\times 10$

$P(Blue) = \dfrac{2}{5} = \dfrac{Blue\ disks}{80} \longrightarrow \dfrac{32}{80} \overset{\times 16}{\underset{\times 16}{\curvearrowleft}} \dfrac{2}{5}$

$10 + 32 + Green\ discs = 80.$

$Green\ discs = 80 - 10 - 32 = 38.$

Answer ___38 green discs___

16   Here is the graph of $y = 7 - 3x$
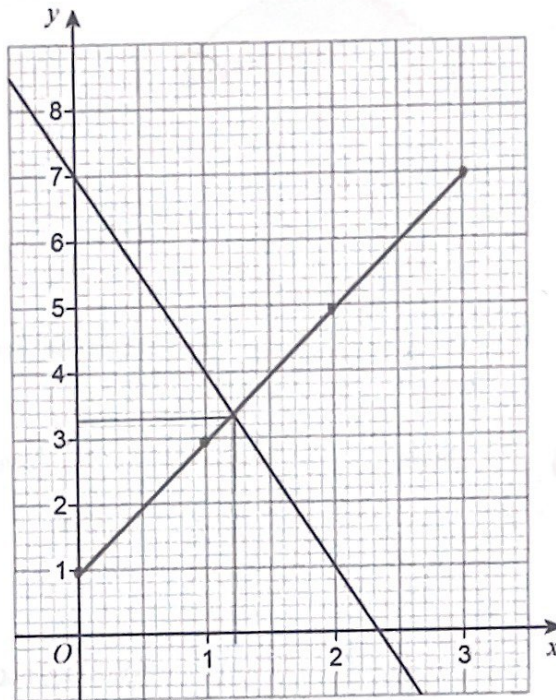
Draw the graph of $y = 2x + 1$ on the grid
and then
work out an approximate solution to $7 - 3x = 2x + 1$

$+1 = y\text{-intercept.}$
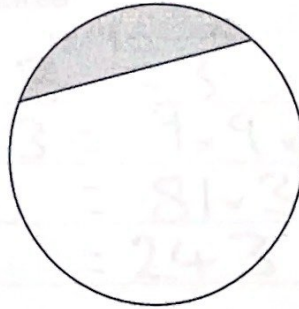$2 = \text{gradient.}$

[3 marks]

Answer $(1 \cdot 2 , 3 \cdot 3), \ x = 1 \cdot 2.$

7

Turn over ▶

17 Part of this circle is shaded.

Circle the name of the shaded part.

[1 mark]

arc   sector   chord   (segment)

18 Work out   80 000 000 ÷ 200

Give your answer in standard form.

[2 marks]

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

$$= 4 \times 10^5$$

Answer 4×10^5

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

Give your answer as a whole number.

[2 marks]

$$3^{12} \div 3^{7} = 3^{12-7} = 3^{5}$$
$$= 3^{2} \times 3^{2} \times 3 = 9 \times 9 \times 3$$
$$= 81 \times 3$$
$$= 243$$

Answer _____ 243 _____

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

Give your answer as a power of 2

[2 marks]

$$8 = 2^{3}, \quad 8 \times 2^{6} \times 2^{4} = 2^{3} \times 2^{6} \times 2^{4}$$
$$= 2^{3+6+4} = 2^{13}$$

2^{13}

Answer _____ 2^{13} _____

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
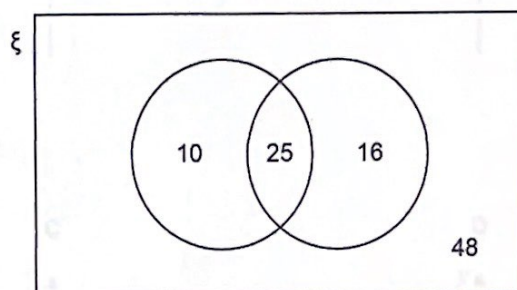
Make **two** criticisms of his diagram.

[2 marks]

Criticism 1   The circles are not Labelled.

Criticism 2   10 + 25 + 16 + 48 = 99, not 98, so 48 should be 47.

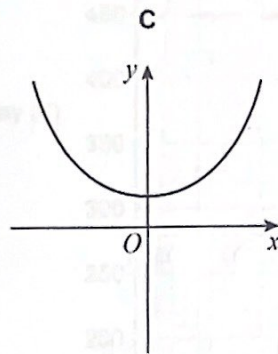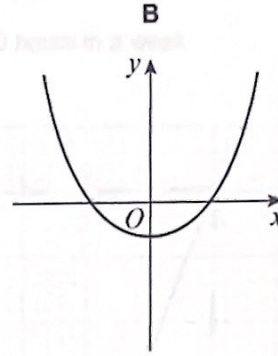**21**   Circle the letter of the possible sketch graph of $y = x^3 - 4$

[1 mark]

A

B

C

D
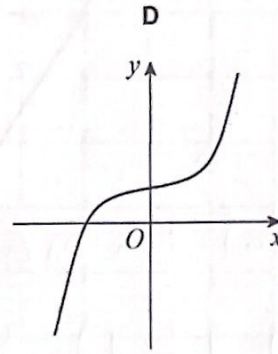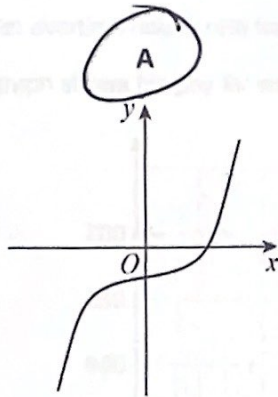
Turn over for the next question

3

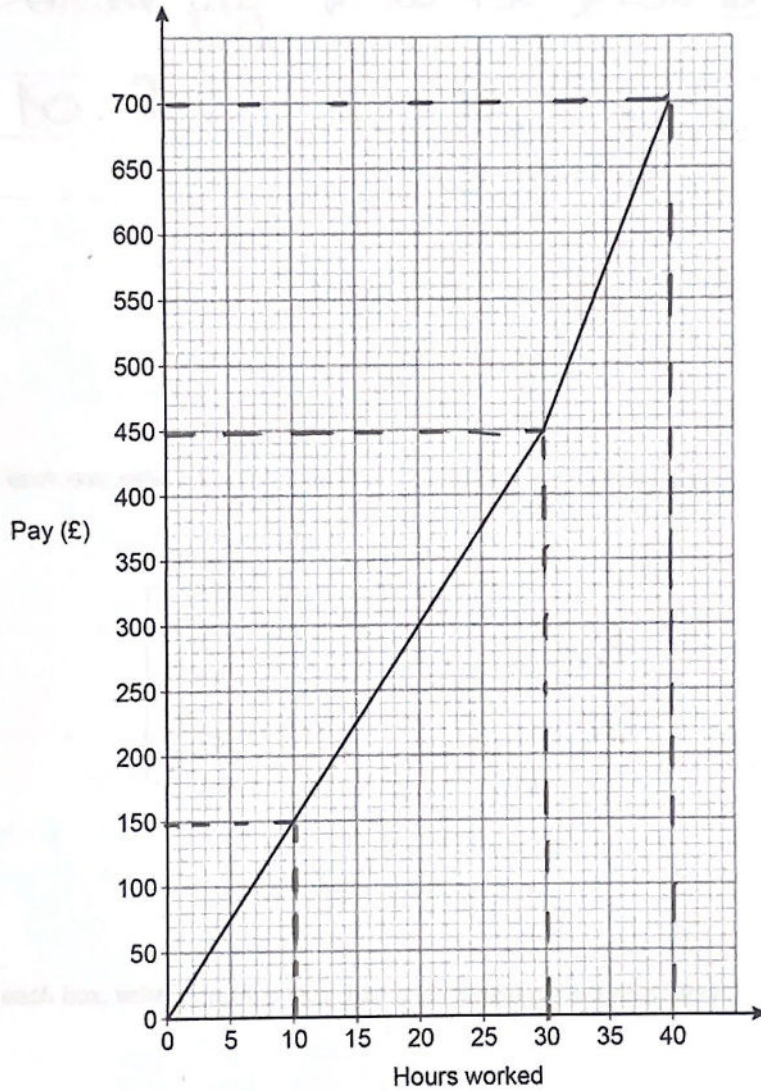**Turn over ▶**

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.

Pay (£)

Hours worked

Work out the ratio   basic hourly rate : overtime hourly rate

Give your answer in its simplest form.

[3 marks]

Basic pay = £150 for 10 hours.

Overtime pay = £ 700 - 450 = £250 for 10 hours.

150 : 250 = 15 : 25 = 3 : 5.

Answer   3 : 5

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

[1 mark]

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

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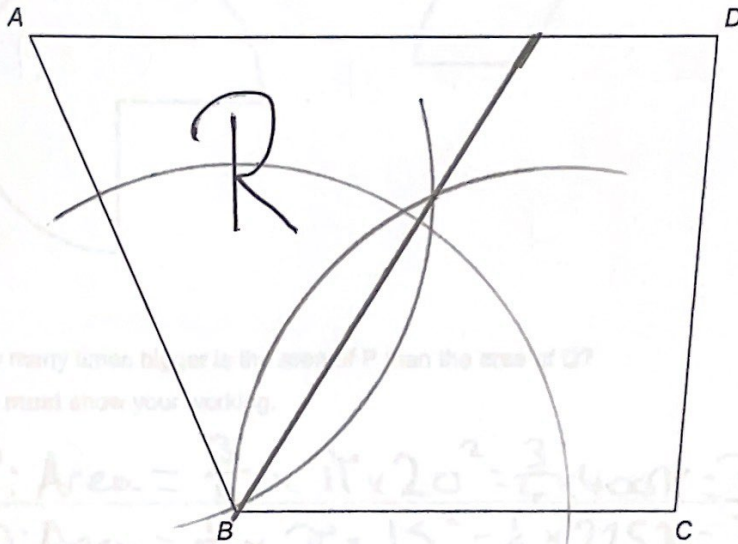
[1 mark]

$$0.1 \times 0.6 = 0.06$$

5

Turn over ▶

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.
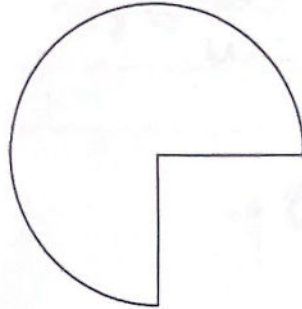
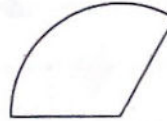Show all your construction lines.

[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]

P: Area $= \frac{3}{4} \times \pi \times 20^2 = \frac{3}{4} \times 400\pi = 300\pi \ cm^2$

Q: Area $= \frac{1}{3} \times \pi \times 15^2 = \frac{1}{3} \times 225\pi = 75\pi \ cm^2$

$$\frac{300\pi}{75\pi} = \frac{300}{75} = 4$$

Answer   4 times.

7

2 5

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

[2 marks]

$$\times 15 \quad 2w = 4 \times 15 \div 5$$

$$\div 2 \left(\dfrac{2w = 12}{w = 6} \right) \div 2$$

$w =$ **6**

27   A solid has volume $300\,\text{cm}^3$ and density $2\,\text{g/cm}^3$

Circle the mass of the solid.

[1 mark]

150 g   298 g   302 g   (600 g)

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

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

[1 mark]

$\dfrac{5}{18}$ $\left(\dfrac{18}{5}\right)$ $\dfrac{9}{10}$ $\dfrac{10}{9}$

END OF QUESTIONS

4