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

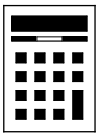
F

Foundation Tier Paper 2 Calculator

Time allowed: 1 hour 30 minutes

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 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	

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

Do not write outside the box

1 Circle the factor of 32

[1 mark]

16 12 3 64

2 y is 3 more than x.

Circle the correct equation.

[1 mark]

$y = 3x$ $y = x + 3$ $y = x - 3$ $y = \frac{x}{3}$

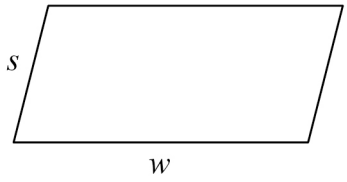
3 Circle the value of 0.15 as a fraction.

[1 mark]

$\frac{1}{5}$ $\frac{1}{6}$ $\frac{3}{20}$ $\frac{3}{50}$

Do not write outside the box

4 Here is a parallelogram.



Circle the expression for the **perimeter**.

[1 mark]

$2s + 2w$ (1) $s + w$ sw $2sw$

5 Work out the value of $a^2 - 4a$ when $a = 10$

[2 marks]

$(10)^2 - 4(10)$

$= 100 - 40$

$= 60$

Answer 60 (2)

Turn over for the next question

6

Do not write outside the box

6 16 people were asked to name their favourite fruit juice.

Here are the results.

Favourite juice	Frequency
Apple	6
Grapefruit	1
Orange	4
Mango	5

6 (a) One of the people was picked at random.

Work out the probability that their favourite juice was orange **or** mango.

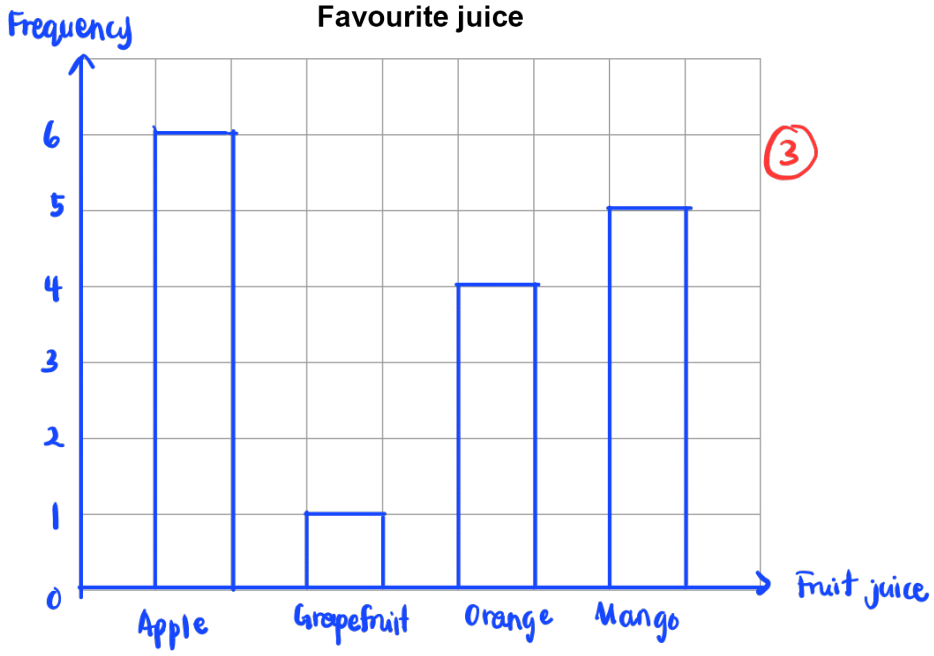
[1 mark]

$\frac{4}{16} + \frac{5}{16} = \frac{9}{16}$

Answer $\frac{9}{16}$ (1)

6 (b) On the grid, draw a bar chart to represent the results.

[3 marks]



Do not write outside the box

7 6 cakes cost £10.74

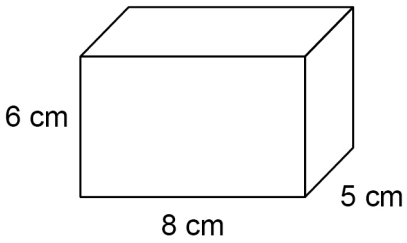
Work out the cost of 11 of these cakes.

[2 marks]

$\frac{11}{6} \times £10.74 = 19.69$ (1) (1)

Answer £ 19.69

8 Here is a cuboid.



Work out the volume.

[1 mark]

$6 \times 8 \times 5 = 240$ (1)

Answer 240 cm^3

7

Do not write outside the box

9 Work out two numbers that

are multiples of 9

and

have a difference of 54

[2 marks]

Multiples of 9 : (9), 18, 27, 36, 45, 54, (63)

63 − 9 = 54

Answer 63 (1) and 9 (1)

10 Convert 11.2 kilometres into miles.

Use 8 km = 5 miles

[2 marks]

$\frac{11.2}{8} \times 5 = 1.4 \times 5$ (1)

$= 7$ (1)

Answer 7 miles

Do not write outside the box

11 Annie spends these amounts in four shops using £20 notes, £10 notes and £5 notes.

Shop A	£65
Shop B	£40
Shop C	£115
Shop D	£75

In each shop she

pays the exact amount

uses the **smallest** possible number of notes.

Work out the total number of each note she uses.

[3 marks]

Shop A : 3 × £20 + 1 × £5

Shop B : 2 × £20

Shop C : 5 × £20 + 1 × £10 + 1 × £5

Shop D : 3 × £20 + 1 × £10 + 1 × £5

£20 : 3 + 2 + 5 + 3 = 13

£10 : 1 + 1 = 2 , £5 : 1 + 1 + 1 = 3

Number of £20 notes 13 (1)

Number of £10 notes 2 (1)

Number of £5 notes 3 (1)

7

Do not write outside the box

12 A sports team played 40 games.

Half were home games and half were away games.

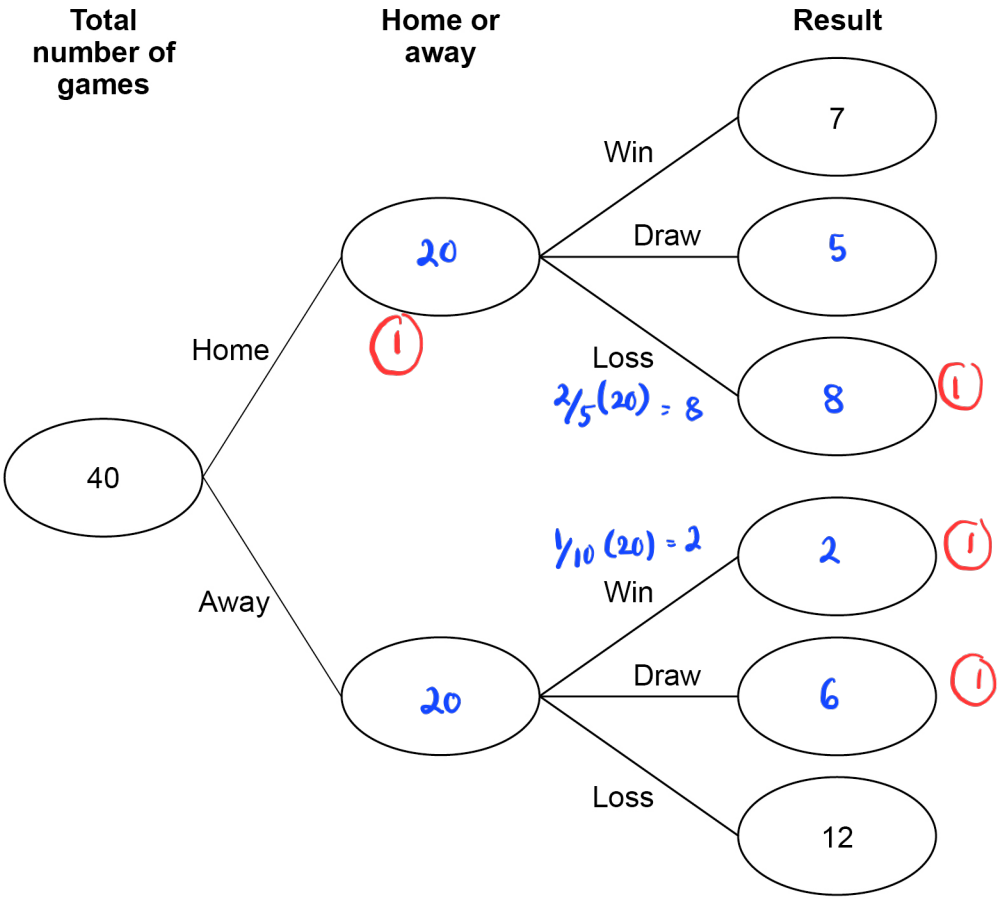
Each game was a win, a draw or a loss.

Of the **home** games, $\frac{2}{5}$ were losses.

Of the **away** games, $\frac{1}{10}$ were wins.

12 (a) Complete the frequency tree.

[4 marks]



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12 (b) The team gets

6 points for a win

3 points for a draw

0 points for a loss.

Work out the **total** number of points that the team got.

[2 marks]

win = 7 + 2 = 9

draw = 5 + 6 = 11

loss = 8 + 12 = 20

Total points = (9 × 6) + (3 × 11)

= 54 + 33 (1)

= 87 (1)

Answer 87

13 Factorise fully $50x + 100$

[2 marks]

50 (x + 2)

Answer 50 (x + 2) (2)

8

Do not write outside the box

14 Some buttons are red or blue in the ratio red : blue = 3 : 5

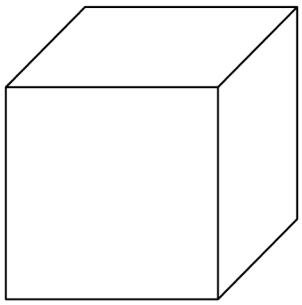
What fraction of the buttons are red? total : 3+5 = 8

Circle your answer.

[1 mark]

$\frac{2}{5}$ $\frac{3}{5}$ $\frac{3}{8}$ (1) $\frac{5}{8}$

15 Which of these is a correct statement about a cube?



Tick **one** box.

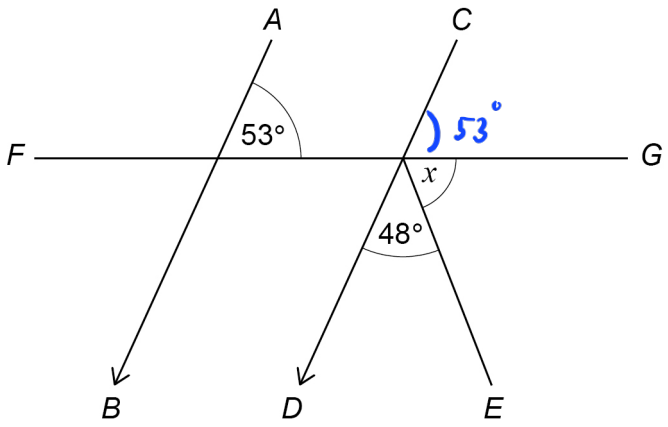
[1 mark]

- [✓] It has 12 edges. (1)
- [ ] It has 12 faces.
- [ ] It has 12 planes.
- [ ] It has 12 vertices.

Do not write outside the box

16 *AB* is parallel to *CD*.

FG is a straight line.



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Work out the size of angle x.

[3 marks]

$x + 48 + 53 = 180$ (1)

$x = 180 - 48 - 53$ (1)

$= 79$ (1)

Answer 79 degrees

5

Do not write outside the box

17 Harry and his sister Jess have some money in the ratio Harry : Jess = 1 : 4

Harry has £7.35

They pay £16.99 for a present for a friend.

Harry uses $\frac{1}{3}$ of his money.

Jess pays the rest.

How much money does Jess have left?

[4 marks]

Jess : £7.35 × 4 = £29.40 (1)

$\frac{1}{3}$ × 7.35 = 2.45 (1)

16.99 − 2.45 = 14.54

29.40 − 14.54 = 14.86 (1)

(1)

Answer £ 14.86

Do not write outside the box

18 Solve $10x - 3 = 21$

[2 marks]

$10x = 24$ (1)

$x = \frac{24}{10} = 2.4$

$x =$ 2.4 (1)

19 Work out which of these fractions is closer in value to 0.5

$\frac{5}{16}$ $\frac{17}{25}$

You **must** show your working.

[2 marks]

$\frac{5}{16} = 0.3125$ (1) $\frac{17}{25} = 0.68$

$0.5 - 0.3125 = 0.1875$ $0.68 - 0.5 = 0.18$

Answer $\frac{17}{25}$ (1)

8

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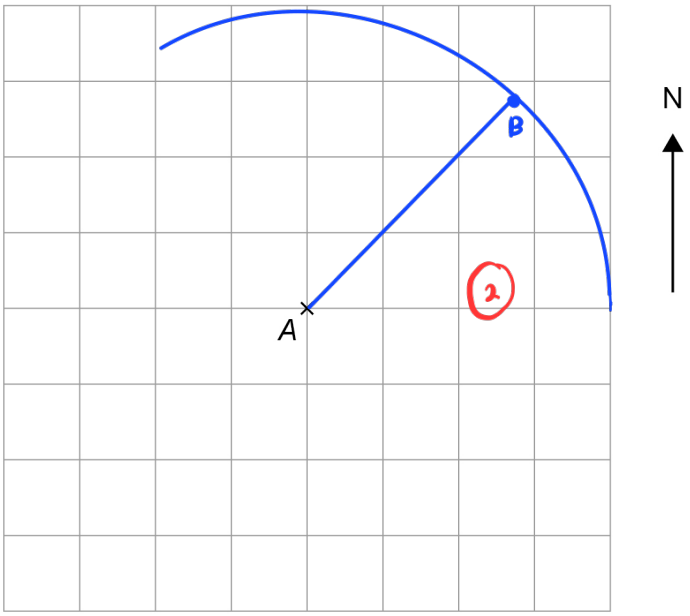
20 (a) Point *B* is 400 metres north east of point *A*.

Mark point *B* on the centimetre grid.

Use a scale of 1 centimetre represents 100 metres.

[2 marks]



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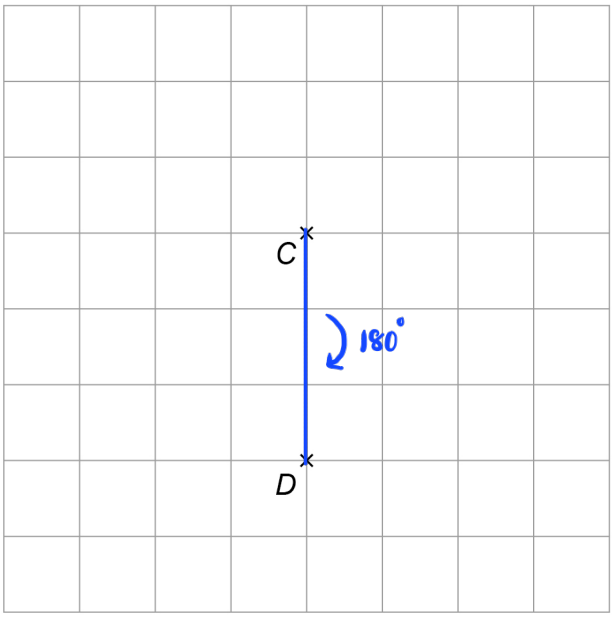
Points *C* and *D* are shown on a different centimetre grid.

Scale: 1 : 1000



20 (b) Work out the bearing of *D* from *C*.

[1 mark]

Answer 180 (1) °

20 (c) Work out the actual distance, in metres, of *D* from *C*.

Use the scale 1 : 1000

[1 mark]

3 cm = 3000 cm

3000 ÷ 100 = 30 m

Answer 30 (1) metres

4

Turn over ►

Do not write outside the box

21 Lynn works as a bus driver.

She is paid £10.80 per hour for the first 38 hours she works each week.

She is paid 25% **more** per hour for each extra hour she works.

One week, Lynn was paid £491.40

In total, how many hours did she work that week?

You **must** show your working.

[5 marks]

$1.25 \times 10.80 = 13.50$ (1)

(1)

$38 \times 10.80 = 410.40$ (1)

$491.40 - 410.40 = 81$

$81 \div 13.50 = 6$ (1)

Total hours : $38 + 6 = 44$ (1)

Answer 44 hours

Do not write outside the box

22 The square root of x is 4

$x = 16$

Circle the value of x^2

$x^2 = 16^2 = 256$

[1 mark]

256 (1) 2 16 8

23 Here is a rule for a sequence.

> After the first two terms, each term is the sum of the previous two terms.

The first five terms are p 23 q 57 r

Work out the values of p, q and r.

[2 marks]

$p + 23 = q$

$23 + q = 57$

$q = 57 - 23 = 34$

$p + 23 = 34$

$p = 34 - 23 = 11$

$34 + 57 = r$

$r = 91$

$p =$ 11

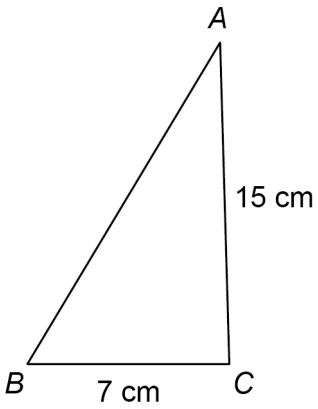
$q =$ 34 (2)

$r =$ 91

8

Do not write outside the box

24 Here is triangle *ABC*.



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24 (a) Assume that angle *ACB* = 90°

Work out the length *AB*.

[3 marks]

$AB^2 = 15^2 + 7^2$ (1)

$= 225 + 49$

$= 274$

$AB = \sqrt{274}$ (1)

$= 16.55\ldots$

(1)

Answer 16.55 ... cm

Do not write outside the box

24 (b) The actual length *AB* is greater than the answer to part (a).

What does this mean about angle *ACB*?

Tick **one** box.

[1 mark]

- ☐ It is 90°
- ☐ It is less than 90°
- ☑ (1) It is more than 90°
- ☐ It could be any of the above.

25 Rearrange $g = 3h - 1$ to make h the subject.

[2 marks]

$g + 1 = 3h$ (1)

$h = \frac{g+1}{3}$

Answer $h = \frac{g+1}{3}$ (1)

6

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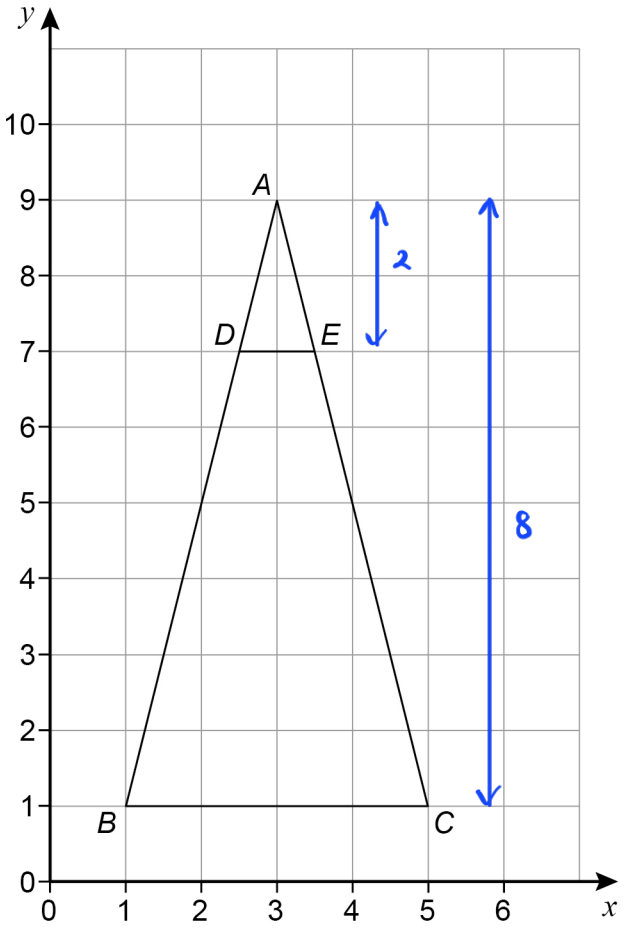
26



$\frac{2}{8} = \frac{1}{4}$

Describe fully the **single** transformation that maps triangle *ABC* to triangle *ADE*.

[3 marks]

Enlargement of scale factor $\frac{1}{4}$ at centre A.

(1) (1) (1)

Do not write outside the box

27 A ball contains 5000 cm^3 of air.

More air is pumped into the ball at a rate of 160 cm^3 per second.

The ball is full of air when it becomes a sphere with radius 15 cm

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

Does it take **less than** 1 minute to fill the ball?

You **must** show your working.

[4 marks]

Volume of ball $= \frac{4}{3} \times \pi \times 15^3$ (1)

$= 14\,137 \ldots$

Air needed : $14\,137 - 5000 = 9137\ cm^3$ (1)

time taken $= \frac{9137\ cm^3}{160\ cm^3 s^{-1}} = 57.1\ s$ (1)

Yes. It takes only 57.1 seconds to fill the ball. (1)

7

Do not write outside the box

28 p is a positive number.

n is a negative number.

For each statement, tick the correct box.

[4 marks]

	Always true	Sometimes true	Never true
$p + n$ is positive		✓ (1)	
$p - n$ is positive	✓ (1)		
$p^2 + n^2$ is positive	✓ (1)		
$p^3 \div n^3$ is positive			✓ (1)

Do not write outside the box

29 250 trains arrived at a station.

The number of trains that were late was recorded after every 50 trains.

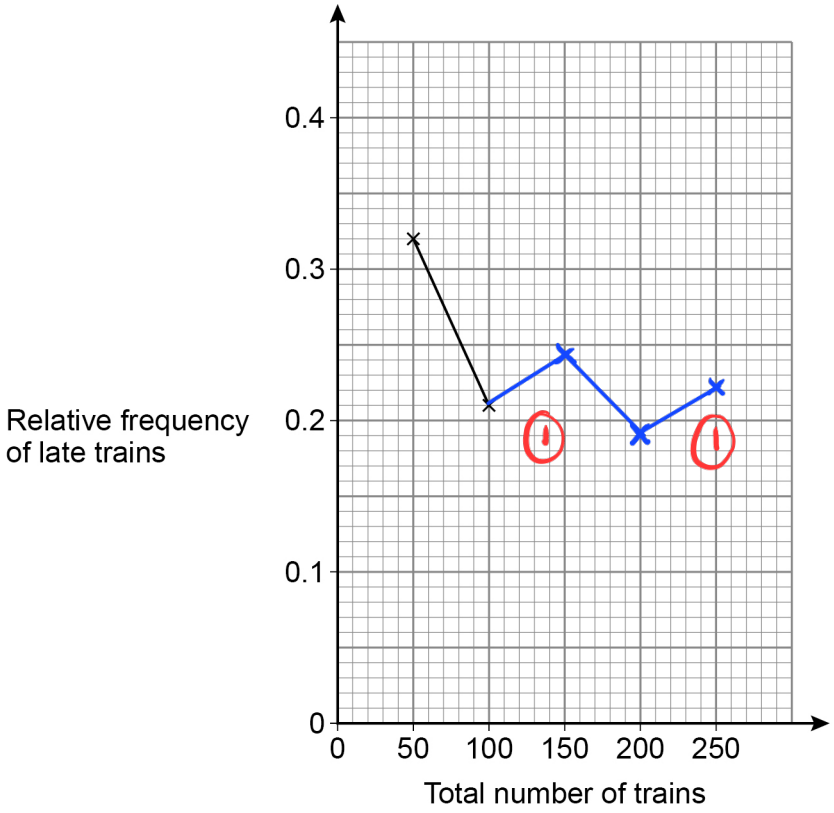
The table shows some information about the results.

Total number of trains	50	100	150	200	250
Total number of late trains	16	21	36	38	55
Relative frequency of late trains	0.32	0.21	0.24	0.19	0.22

(1)

29 (a) Complete the relative frequency graph.

[3 marks]



(1) (1)

29 (b) Write down the best estimate of the probability that a train arriving at the station is late.

[1 mark]

$55 \div 250 = 0.22$

Answer 0.22 (1)

8

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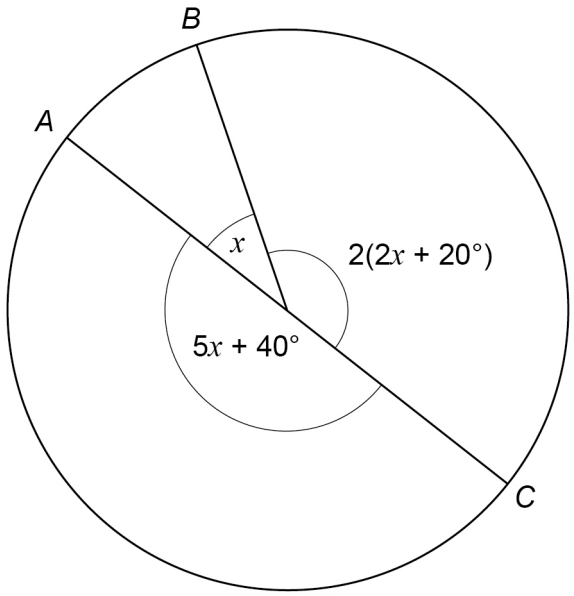
30 *A*, *B* and *C* are three points on a circle.

The radii from *A*, *B* and *C* are shown.

Not drawn accurately



Is *AC* a diameter of the circle?

You **must** show your working.

[3 marks]

(1)

$x + 2(2x + 20^\circ)$

$= x + 4x + 40^\circ$ (1)

$= 5x + 40^\circ$ (1)

Yes.

Do not write outside the box

31 A straight line

has gradient 6

and

passes through the point (3, 19)

Work out the equation of the line.

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

[3 marks]

$19 = 6(3) + c$ (1)

$c = 19 - 18$

$= 1$ (1)

$y = 6x + 1$

Answer $y = 6x + 1$ (1)

END OF QUESTIONS

6

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ANSWER IN THE SPACES PROVIDED

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