AQA

.CG Maths.
Hints

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

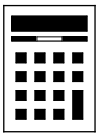
F

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	

Please note that these worked solutions have neither been provided nor approved by AQA and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

.CG Maths.

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

The factor is the one which 32 can be divided by to get a whole number answer

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.

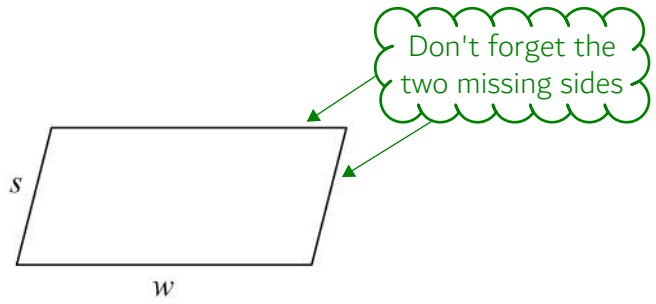
[1 mark]

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

Enter 0.15 into the calculator then press =

Do not write outside the box

4 Here is a parallelogram.



Circle the expression for the **perimeter**.

[1 mark]

$2s + 2w$ $s + w$ sw $2sw$

Perimeter means to add all the outside edges together. The opposite sides on a parallelogram are equal

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

[2 marks]

$10^2 - 4 \times 10$ ← Substituting a for 10

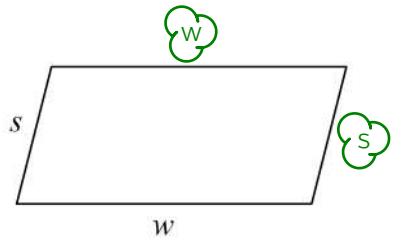
Answer _____

Turn over for the next question

6

Do not write outside the box

4 Here is a parallelogram.



Circle the expression for the **perimeter**.

[1 mark]

$2s + 2w$ $\quad s + w \quad sw \quad 2sw$

Perimeter means to add all the outside edges together.
The opposite sides on a parallelogram are equal

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

[2 marks]

$10^2 - 4 \times 10$ ← Substituting a for 10

Answer 60

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.

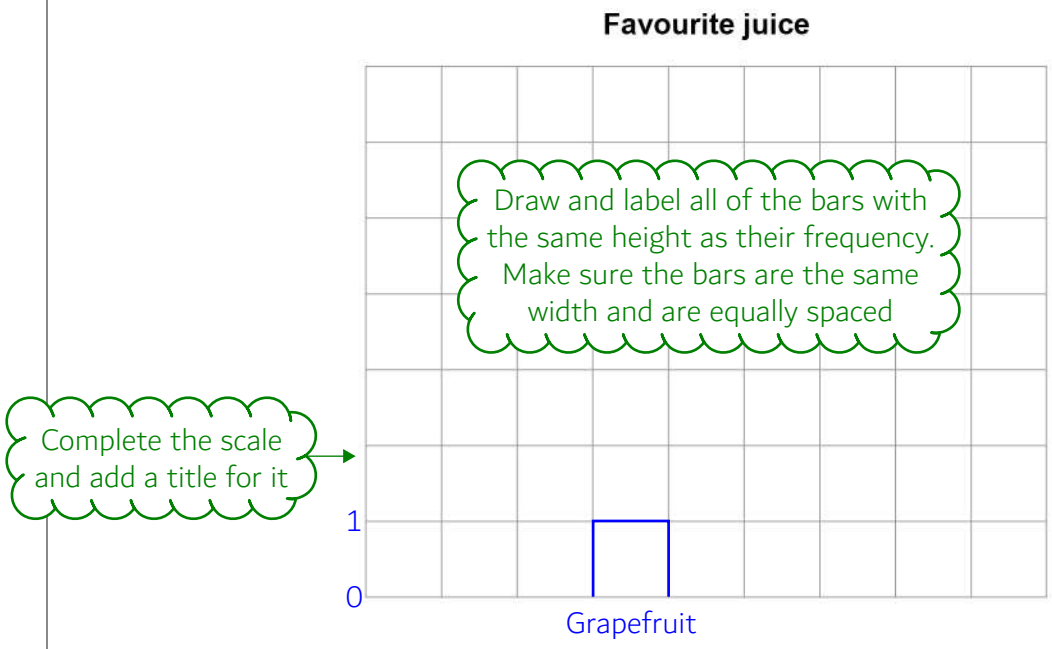
[1 mark]

Answer _____

4 + 5 = 9. So 9 out of the 16 people chose orange or mango

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

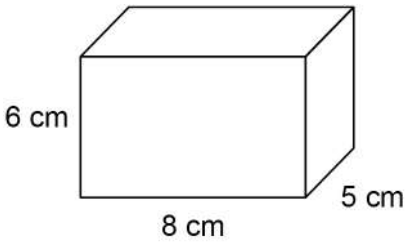
Work out the cost of 11 of these cakes.

[2 marks]

Dividing the cost by 6 works out the cost of 1 cake.
Multiplying this by 11 works out the cost of 11

Answer £ _____

8 Here is a cuboid.



Work out the volume.

[1 mark]

Volume of cuboid = length x width x height

Answer _____ cm^3

7

Turn over ►

Do not write outside the box

9 Work out two numbers that

are multiples of 9 ← In the 9 times table: 9, 18, 27...

and

have a difference of 54 ← Largest - smallest = 54

[2 marks]

Answer _____ and _____

10 Convert 11.2 kilometres into miles.

Use 8 km = 5 miles

[2 marks]

Work out how many lots of 8km go into 11.2km. Each lot of 8km is a lot of 5 miles

Answer _____ 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

3X20+5

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]

For each shop as many £20 notes as possible should be used. Then using £10 and £5 notes if necessary

Number of £20 notes _____

Number of £10 notes _____

Number of £5 notes _____

3 £20s and 1 £5 are used in shop A

7

Do not write outside the box

12 A sports team played 40 games.

Half were home games and half were away games.

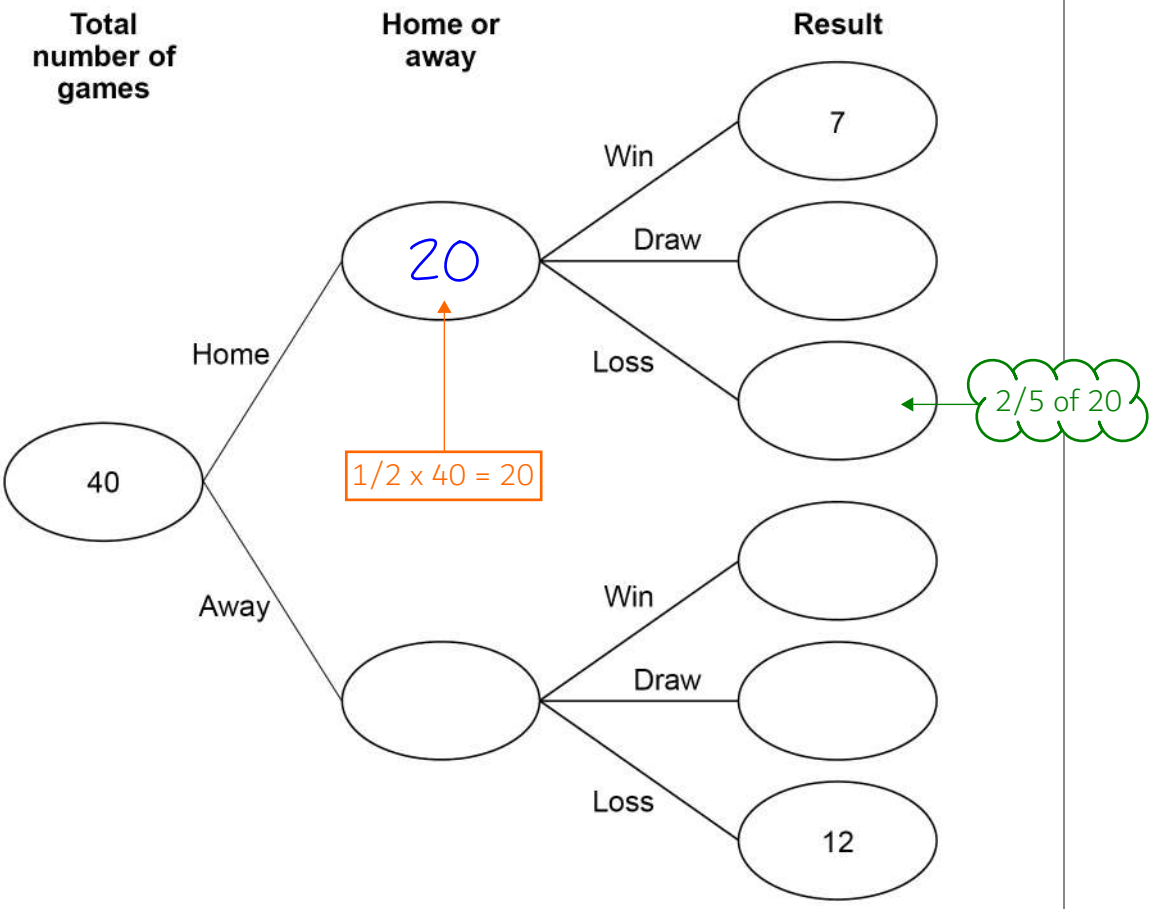
Each game was a win, a draw or a loss.

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]



Do not write outside the box

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]

Adding the points for the wins and draws gives the total number of points. The losses are ignored as there are no points for these. Multiply the number of wins by the points for each win to get the points for the wins

Answer _____

13 Factorise fully $50x + 100$

[2 marks]

Find the highest common factor of 50x and 100. Bring this out as a factor. Divide both 50x and 100 by this factor and leave the results in a bracket next to the factor

Answer _____

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?

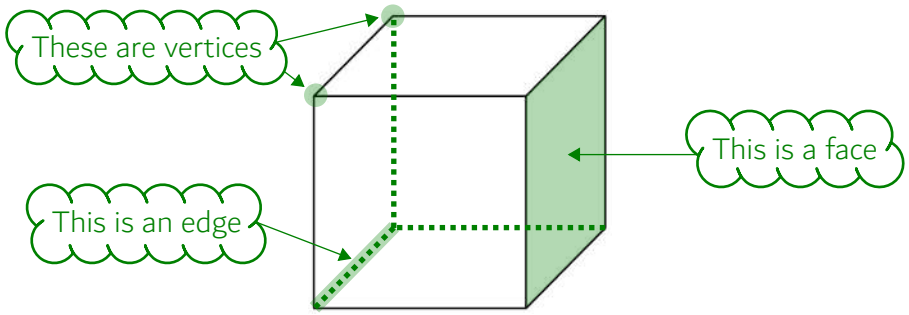
Circle your answer.

[1 mark]

$\frac{2}{5}$ $\frac{3}{5}$ $\frac{3}{8}$ $\frac{5}{8}$

There are 8 parts in total in the ratio. Out of these 3 are red

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



Tick **one** box.

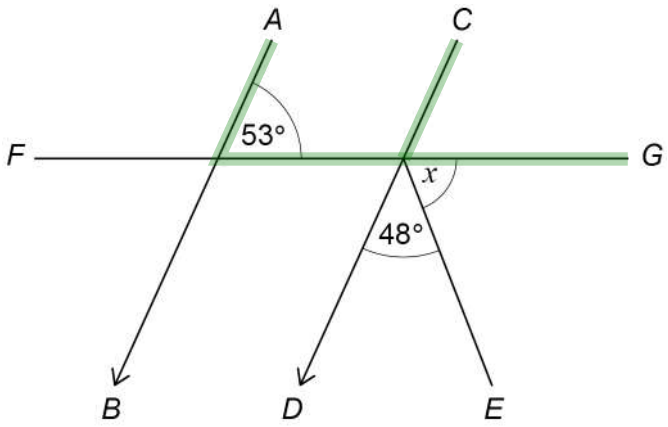
[1 mark]

- ☐ It has 12 edges.
- ☐ 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.



Not drawn accurately

Work out the size of angle x.

[3 marks]

Corresponding angles are equal. Angles around a point on a straight line add up to 180.

Answer _____ 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]

Subtracting what Jess has to pay from what she has leaves the amount she has left. Subtracting what Harry pays from the £16.99 works out how much Jess has to pay. The ratio tells us that Jess has 4 times as much as Harry

Answer £ _____

Do not write outside the box

18 Solve $10x - 3 = 21$

[2 marks]

The 10 and the -3 needs to be eliminated from the left side to get x on its own. Do the opposite operation to both sides to eliminate. Follow BIDMAS backward to decide which order to eliminate in

$x =$ _____

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]

Subtracting the fractions from 0.5 tells us how far away they are from 0.5. Ignore any negative sign before the distance. The one with the smallest distance is the closest

Answer _____

8

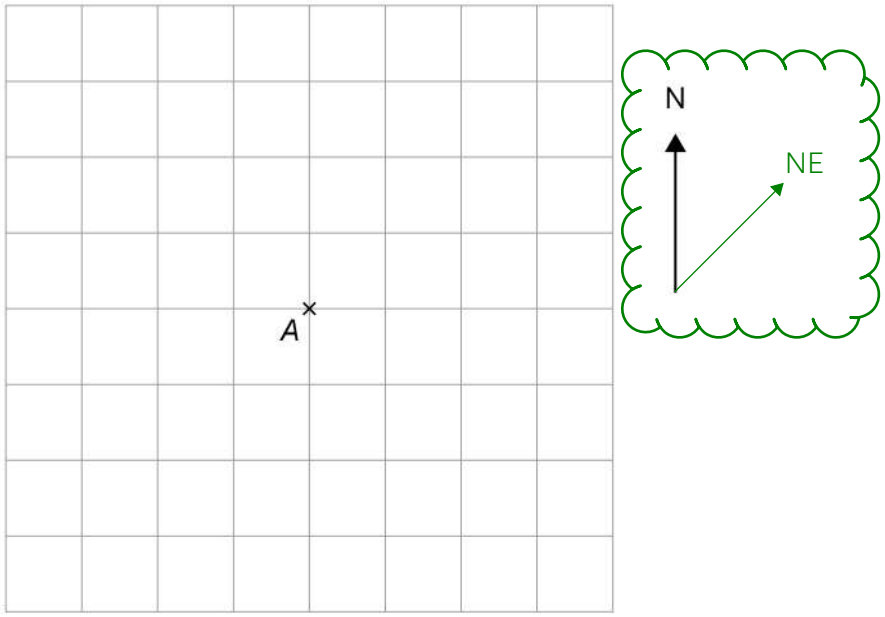
Do not write outside the box

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]

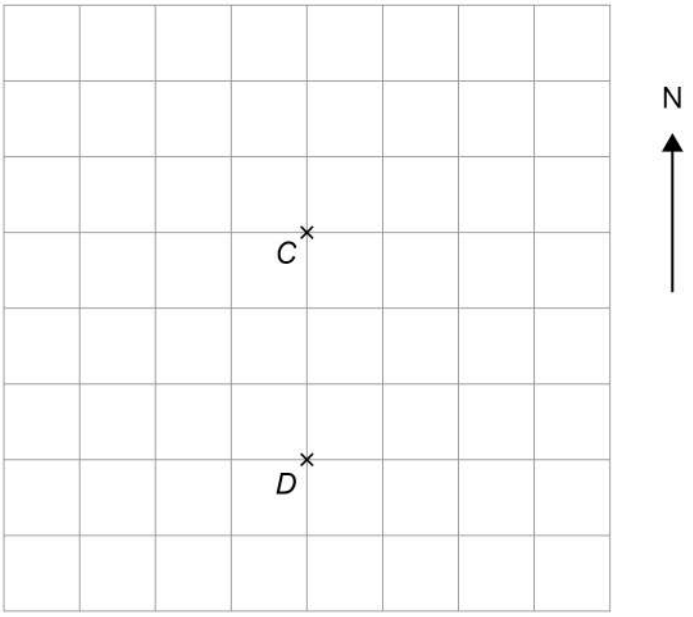


Each 100m is represented by 1cm. 400 is 4 lots of 100

Do not write outside the box

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 _____ °

???° are turned clockwise from north at point C to face point D

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

Use the scale 1 : 1000

[1 mark]

There are 3 boxes between C and D on the grid and each box is worth 1cm as it is on a centimetre grid. The actual distance is 1000 times greater according to the scale. There are 100 centimetres in a metre, use this to convert the centimetres to metres

Answer _____ metres

4

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]

Work out how much she earned in the first 38 hours. Subtracting this from the £491.40 leaves the amount she got for the extra hours. Increase the £10.80 by 25% to get what she is paid per hour for extra hours. Dividing the amount she got for the extra hours by what she is paid per hour for extra hours works out how many hours extra she did. Adding this to the 38 hours gives the hours she worked that week in total

Answer _____ hours

Do not write outside the box

22 The square root of x is 4

Circle the value of x^2

[1 mark]

256 2 16 8

Squaring 4 undoes the square root and finds out what x is. Squaring this again works out what x^2 is

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]

23 + q = 57. Rearrange to find q.
p + 23 = q. Substitute in q and rearrange to find p.
q + 57 = r. Substitute in q to find r

$p =$ _____

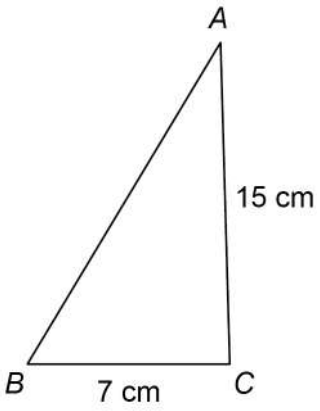
$q =$ _____

$r =$ _____

8

Do not write outside the box

24 Here is triangle *ABC*.



Not drawn accurately

24 (a) Assume that angle *ACB* = 90°

Work out the length *AB*.

[3 marks]

$a^2+b^2=c^2$ ← ABC is a right angled triangle so Pythagoras' Theorem, where c is the longest side and a and b are the shorter sides, can be used to work out side AB

Answer _____ 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°
- ☐ It is more than 90°
- ☐ ~~It could be any of the above.~~

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

[2 marks]

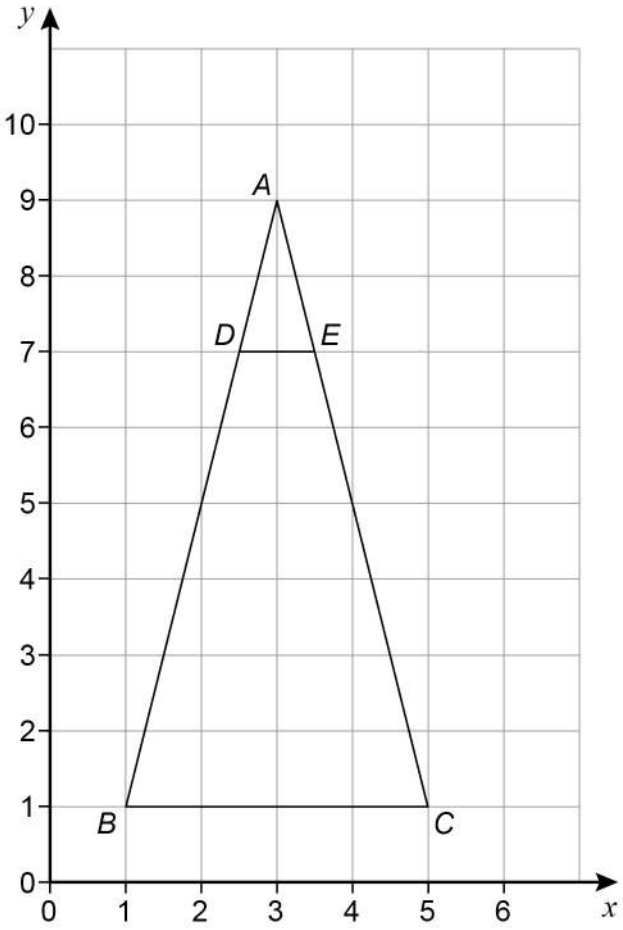
The 3 and the -1 needs to be eliminated from the right side to get h on its own. Do the opposite operation to both sides to eliminate. Follow BIDMAS backward to decide which order to eliminate in

Answer _____

6

Do not write outside the box

26



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

[3 marks]

Enlargement by scale factor ? from (? , ?)

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]

s d t

Quoting the distance, speed, time formula triangle as the volume is basically distance, the rate it is pumped is basically speed and we are calculating time

Subtracting the 5000cm^3 already in the ball from the volume of the ball when full, which can be worked out using the volume of a sphere formula, leaves the volume needed to fill the ball, which can be thought of as the distance. The rate the air is pumped into the ball can be thought of as the speed. The time calculated will be in seconds and can be compared to a minute, which is 60 seconds

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	☐	☐	☐
$p - n$ is positive	☐	☐	☐
$p^2 + n^2$ is positive	☐	☐	☐
$p^3 \div n^3$ is positive	☐	☐	☐

2 + -1 = 1. 1 + -2 = -1. Subtracting a negative is a double negative so it becomes a positive and a positive add a positive must be positive. Squaring means to multiply by itself and a positive multiplied by a positive is positive and a negative multiplied by a negative is double negative so becomes a positive and a positive add a positive must be positive. A positive cubed is positive and a negative cubed is negative and dividing a positive by a negative gives a negative

Do not write outside the box

29 250 trains arrived at a station.

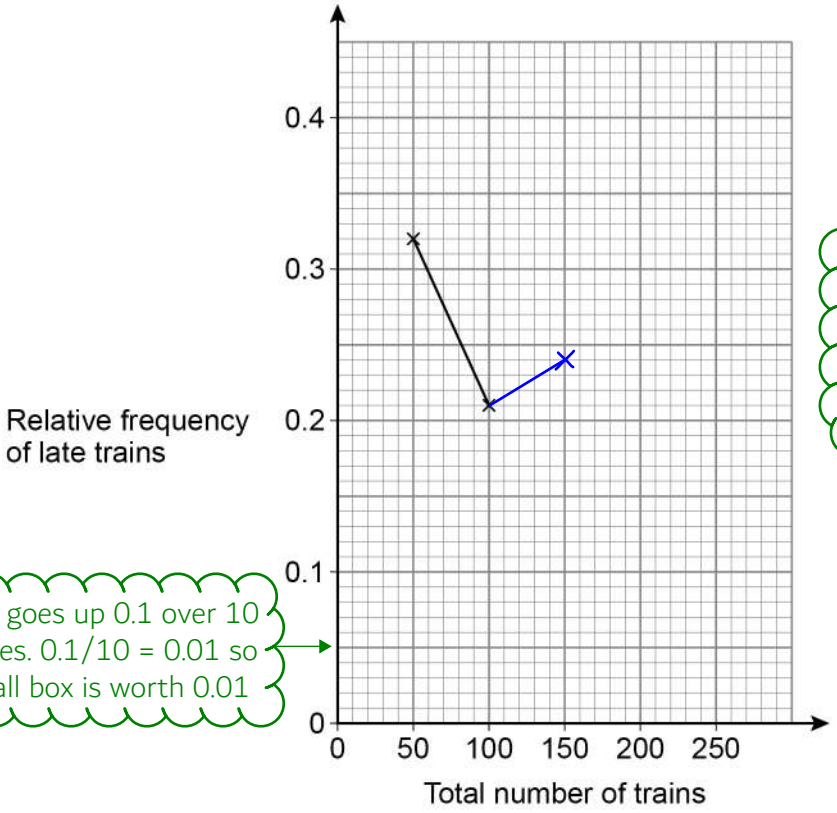
The number of trains that were late was recorded after every 50 trains.

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			

29 (a) Complete the relative frequency graph.

[3 marks]



36/150 = 0.24

Expressing the number of late trains as a fraction of the total number of trains gives the relative frequency. Converting these to decimals so they can be plotted

The scale goes up 0.1 over 10 small boxes. 0.1/10 = 0.01 so each small box is worth 0.01

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

[1 mark]

Answer _____

Each relative frequency is an estimate of the probability but the best one is the one based on the most trains

8

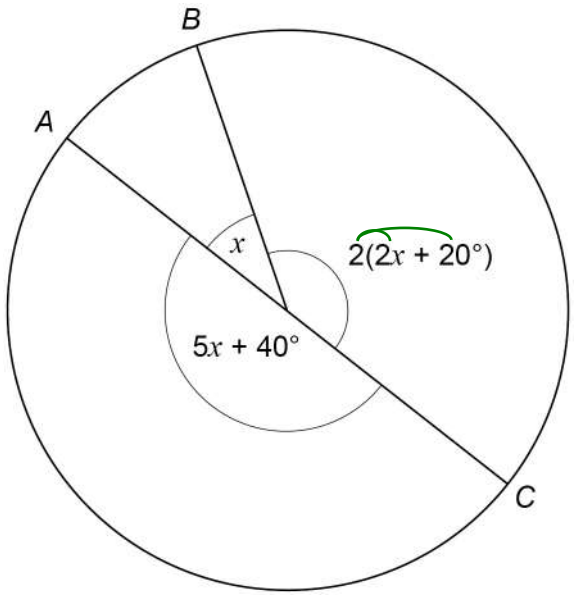
Turn over ►

Do not write outside the box

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]

A diameter is a straight line going through the centre of a circle. If the angles above AC are the same as the angle below AC, this must be the case

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]

m is the gradient. Rearrange to make c the subject then substitute in the coordinates from the point and m to find c

Answer _____

END OF QUESTIONS

6