

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

Foundation Tier

Paper 2 Calculator

F

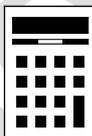
Shadow paper based on 2020 question paper

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	
26–27	
28	
TOTAL	

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

1 Circle the ratio that is the same as 4 : 5

[1 mark]

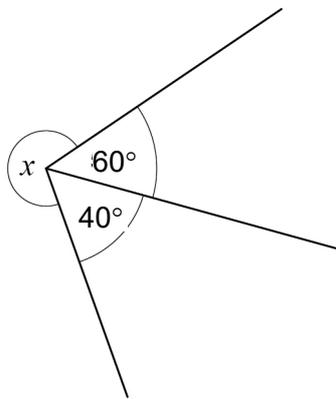
8 : 9

8 : 10

8 : 12

16 : 25

2



Not drawn
accurately

Circle the size of angle x .

[1 mark]

80°

100°

260°

265°

3 Circle the expression that has the **smallest** value when $x = 6$

[1 mark]

$7 - x$

$\frac{1}{2}x$

$x - 4$

$x + 1$

4 The term-to-term rule for a sequence is

add 2 then double

The first two terms are 2 and 8

Circle the next term.

[1 mark]

10

14

18

20

5 (a) Solve $8x = 56$

[1 mark]

$x =$ _____

5 (b) Solve $36 - y = 27$

[1 mark]

$y =$ _____

- 6** Nine people play a game.
Here are their scores.

12 15 9 18 18 14 8 16 20

- 6 (a)** Write down the mode.

[1 mark]

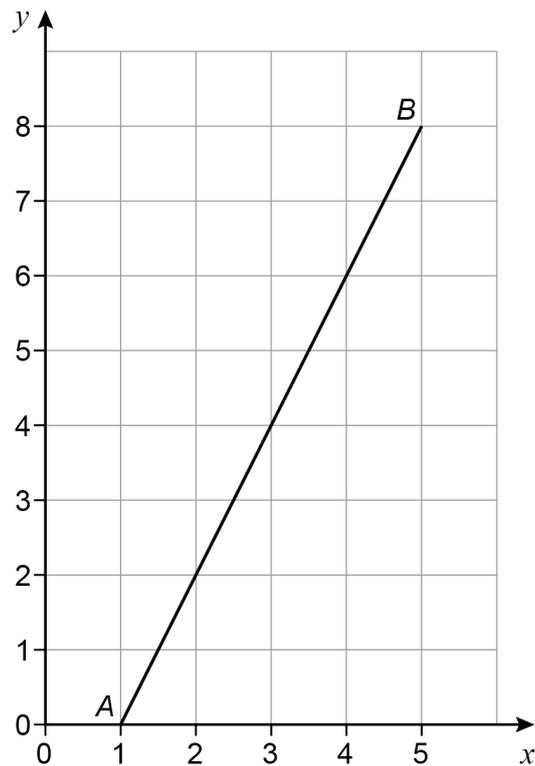
Answer _____

- 6 (b)** Work out the median.

[2 marks]

Answer _____

- 7 Line AB is shown where A is the point $(1, 0)$ and B is the point $(5, 8)$



- 7 (a) P is a point on AB .
The distance AP is half the distance AB .
Work out the coordinates of P .

[1 mark]

Answer (_____ , _____)

- 7 (b) A line is drawn from B that is
parallel to the x -axis
meets the y -axis at point Q .
Work out the coordinates of Q .

[1 mark]

Answer (_____ , _____)

8 (a) Write down an even whole number that is also a cube number.

[1 mark]

Answer _____

8 (b) Write down **all** the square numbers between 200 and 300

[2 marks]

Answer _____

8 (c) Write down **two** numbers that
are multiples of 5
and
multiply to make 1625

[1 mark]

Answer _____ and _____

9 Members of a squash club are Advanced, Intermediate or Beginner.

9 (a) Here is a report about the members of the club.

29% are Advanced
42% are Intermediate
39% are Beginner

Give a reason why there **must** be a mistake in the report.

[1 mark]

9 (b) An Intermediate membership fee is £180

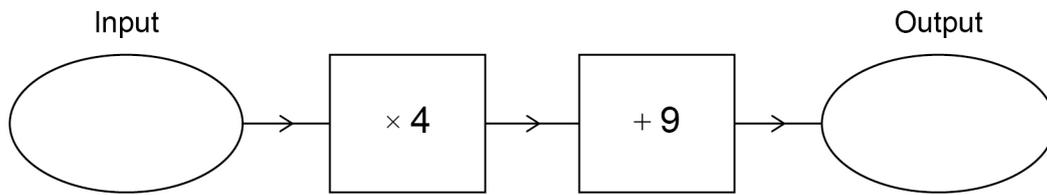
A Beginner membership fee is $\frac{1}{3}$ of the Intermediate fee.

Work out the **total** membership fee for 3 Intermediate and 4 Beginners.

[3 marks]

Answer £ _____

10 (a) Here is a number machine.

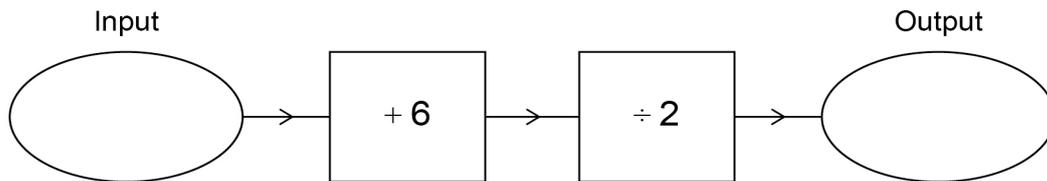


Work out the output when the input is 7

[1 mark]

Answer _____

10 (b) Here is a different number machine.



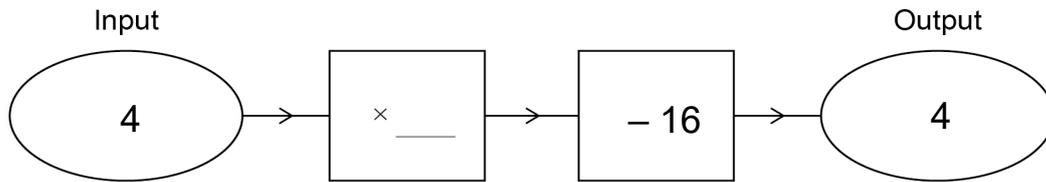
Work out the output when the input is -20

[1 mark]

Answer _____

10 (c) Complete this number machine.

[1 mark]



11 Here are two calculations.

A

$$19^2 - 320$$

B

$$58 \times 18 - 10^3$$

Which calculation has the smaller answer?

You **must** show the answer to each calculation.

[2 marks]

Answer _____

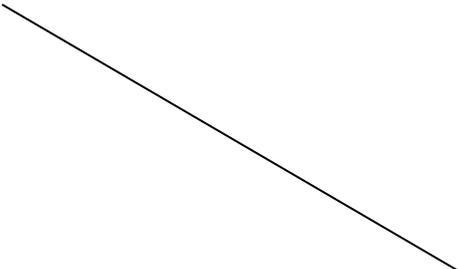
12

Match each expression on the left with one on the right.

One has been done for you.

[4 marks]

$16ab \div 4$	$3ab$
$a + a + a$	$4 + a$
$3 \times a \times b$	$4ab$
$a \times a \times a$	$3a$
$a + a + b$ $+ b$	a^3
	$2ab$
	$2a + 2b$



- 13** Lola works for 40 hours and is paid £464
William works for 44 hours and is paid £473
Lola is paid more per hour than William.
How much more?

[3 marks]

Answer _____ pence

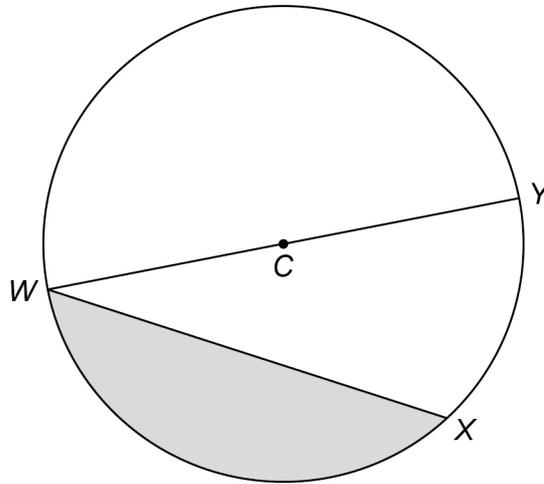
Turn over for the next question

14

This circle has centre C .

W , X and Y are points on the circle.

WY is a straight line.



Tick **one** box for each statement.

[3 marks]

	True	False
The shaded section is a sector.	<input type="checkbox"/>	<input type="checkbox"/>
Arc XY is part of the circumference.	<input type="checkbox"/>	<input type="checkbox"/>
WY is a diameter.	<input type="checkbox"/>	<input type="checkbox"/>
WX is a radius.	<input type="checkbox"/>	<input type="checkbox"/>

15 Mortar is made by mixing cement and sand as shown.

For every 1 kg of cement used, add 4.5 kg of sand

Cement costs £0.21 per kg

Sand costs £0.09 per kg

Toni uses 180 kg of cement to make some mortar.

Work out the total cost of the mortar.

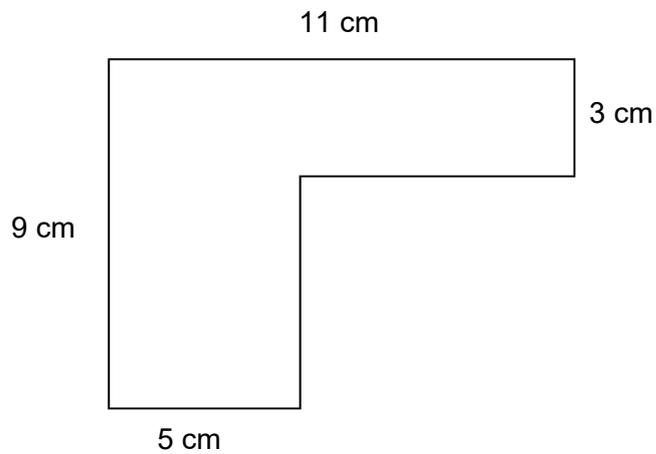
[3 marks]

Answer £ _____

Turn over for the next question

16 (a) Here is a shape made from rectangles.

Not drawn
accurately

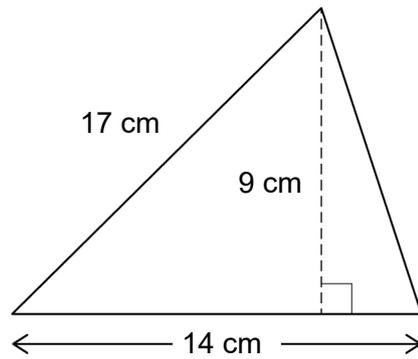


Work out the area.

[3 marks]

Answer _____ cm^2

- 16 (b) Zak wants to work out the area of this triangle.



Not drawn accurately

Here is his working.

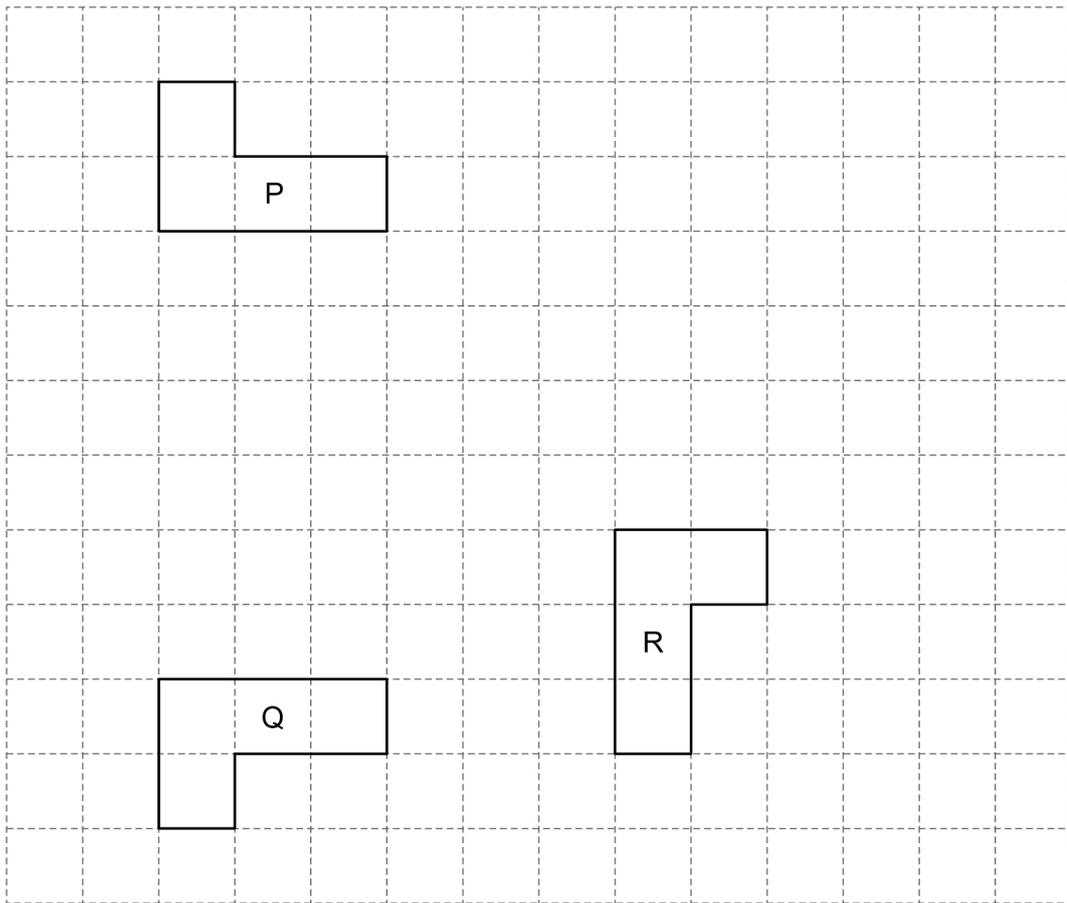
$$14 \times 9 = 126 \text{ cm}^2$$

What is wrong with his method?

[1 mark]

Turn over for the next question

17 Here are shapes P, Q and R.



17 (a) R is mapped to P by a single transformation.

Circle the type of transformation.

[1 mark]

rotation

translation

reflection

enlargement

17 (b) Q is mapped to P by a single transformation.

Circle the type of transformation.

[1 mark]

rotation

translation

reflection

enlargement

- 18** Sheena buys pet food in 2.5 kg packs.
Her pet needs 0.75 kg of food each week.
She wants to have enough food for the next 18 weeks.
She already has two 2.5 kg packs.
- Work out the smallest number of packs she needs to buy.
You **must** show your working.
- [4 marks]**

Answer _____

Turn over for the next question

- 19 A scale drawing shows the positions of P , Q and R .



Not drawn
accurately

On the scale drawing

$$PQ = 4 \text{ cm} \quad QR = 6.5 \text{ cm}$$

The actual distance PQ is 150 metres less than the actual distance QR .

Work out the scale.

[3 marks]

Answer 1 cm represents _____ metres

20 (a) a and b are whole numbers.

$$a \leq 15 \quad b < 11$$

Work out the **largest** possible value of $a + 2b$

[2 marks]

Answer _____

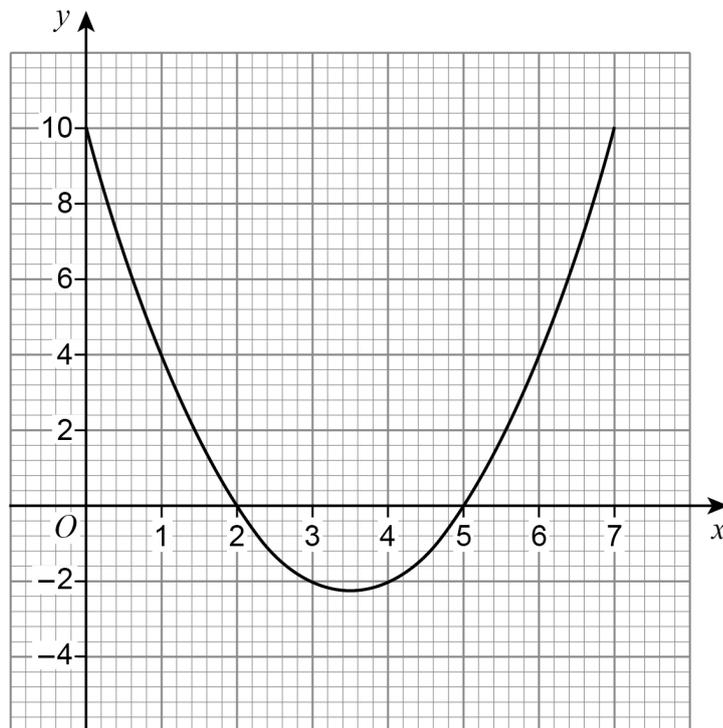
20 (b) x and y are both **negative** numbers.

Show that $\frac{y}{x}$ could equal 5

[1 mark]

Turn over for the next question

- 22 Here is the graph of $y = x^2 - 7x + 10$ for values of x from 0 to 7



- 22 (a) Write down the roots of $x^2 - 7x + 10 = 0$

[2 marks]

Answer _____

- 22 (b) Write down the x -coordinate of the turning point of the curve.

[1 mark]

Answer _____

23

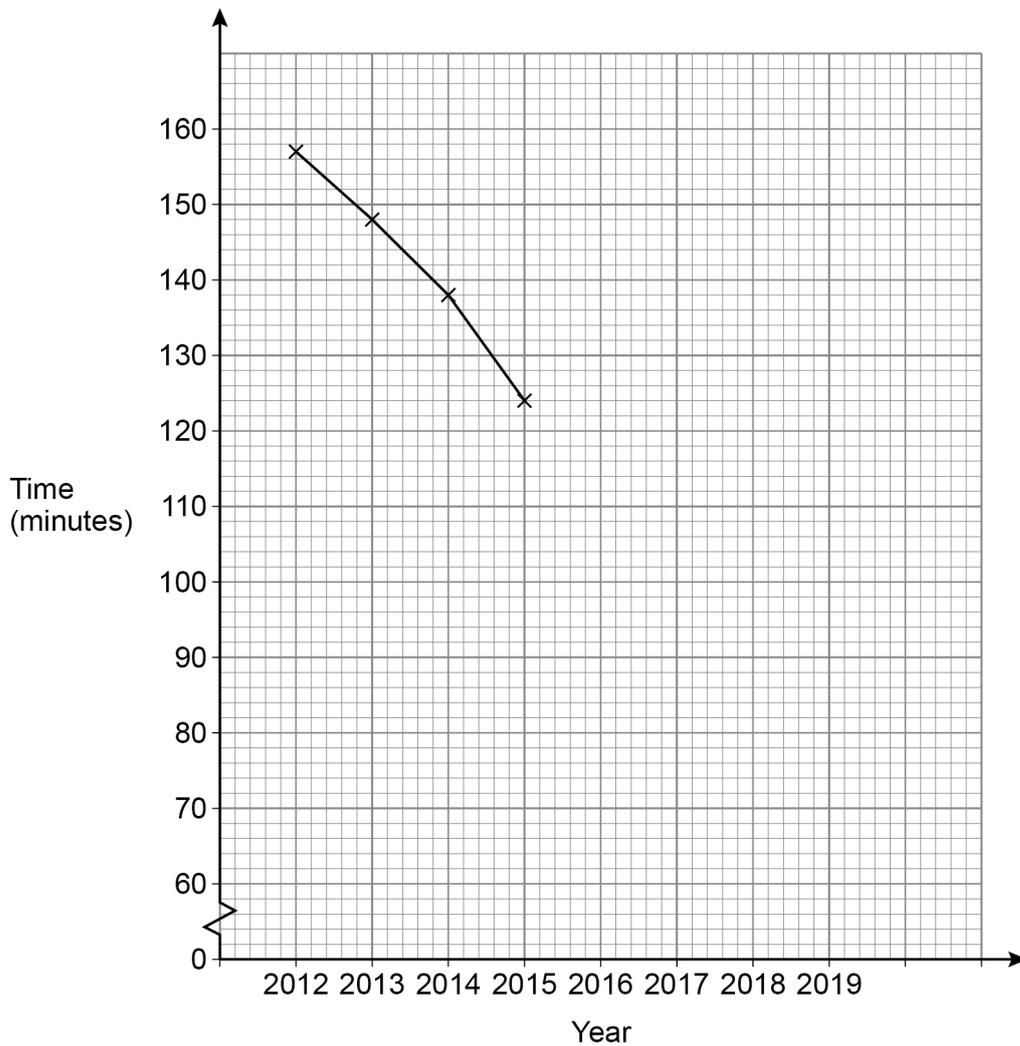
The time students spent watching TV was recorded.

The table shows the average daily time per student each year from 2012 to 2019

Year	2012	2013	2014	2015	2016	2017	2018	2019
Time (minutes)	157	148	138	124	120	112	104	98

A time series graph is drawn to represent the data.

The first four points have been plotted.



23 (a) Complete the graph.

[2 marks]

23 (b) Use the graph to estimate the average daily time per student in 2020

[1 mark]

Answer _____ minutes

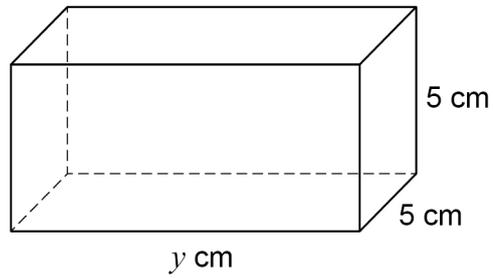
24 Work out the highest common factor (HCF) of 112 and 144

[2 marks]

Answer _____

Turn over for the next question

25 Here is a cuboid.



25 (a) Assume that the total surface area of the cuboid is 300 cm^2

Work out the volume of the cuboid.

[3 marks]

Answer _____ cm^3

25 (b) In fact, the total surface area of the cuboid is bigger than 300 cm^2

What does this mean about the volume of the cuboid?

Tick **one** box.

[1 mark]

It is smaller than the answer to part (a)

It is bigger than the answer to part (a)

It is the same as the answer to part (a)

It could be any of the above

26 Here is some information about the time spent in the gym by 50 people.

Time, t minutes	Number of people
$0 < t \leq 15$	4
$15 < t \leq 30$	11
$30 < t \leq 45$	28
$45 < t \leq 60$	7

Circle the number of people who spent more than 30 minutes.

[1 mark]

11

15

35

43

27

At a zoo there are 70 children.

31 are girls and 39 are boys.

Some girls arrive.

Some boys leave.

The ratio of girls to boys is now 11 : 12

Are there now more than 70 children at the zoo?

Tick **one** box.

Yes

No

Cannot tell

Show working to support your answer.

[2 marks]

28

Alex and Bev sat six tests, each with 60 marks.

The table shows their mean percentages after five tests.

Alex	60%
Bev	55%

After all six tests, their mean percentages were equal.

In the sixth test, Alex scored 24 out of 60

Work out Bev's score, out of 60, in the sixth test.

[4 marks]

Answer _____ out of 60

Turn over for the next question

- 29** A solid piece of gold has
mass 6.755 kilograms
volume 350 cm^3
- Work out the density of the piece of gold.
Give your answer in grams per cubic centimetre.
- [2 marks]**

Answer _____ g/cm^3

- 30** Work out the gradient of the straight line through $(-2, 1)$ and $(1, 10)$
- [2 marks]**

Answer _____

END OF QUESTIONS

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