



Please write clearly in block capitals.

Centre number

Candidate number

Surname MODEL SOLUTIONS

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 5 November 2019 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments



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.
- 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.



Answer **all** questions in the spaces provided

- 1 Circle the value of the digit 9 in the number 7.962

[1 mark]

$$\frac{9}{1000}$$

$$\frac{9}{100}$$

$$\frac{9}{10}$$

9

- 2 Solve $3x = 6$
Circle your answer.

[1 mark]

$$x = 0.5$$

$$x = 2$$

$$x = 3$$

$$x = 18$$

- 3 Circle the correct statement.

[1 mark]

$$0.3 > \frac{1}{4}$$

$$0.3 = \frac{1}{4}$$

$$0.3 \leq \frac{1}{4}$$

$$0.3 < \frac{1}{4}$$



- 4 Circle the number that is closest in value to $\sqrt{50}$

[1 mark]

5

7

8

25

- 5 Work out 76×24

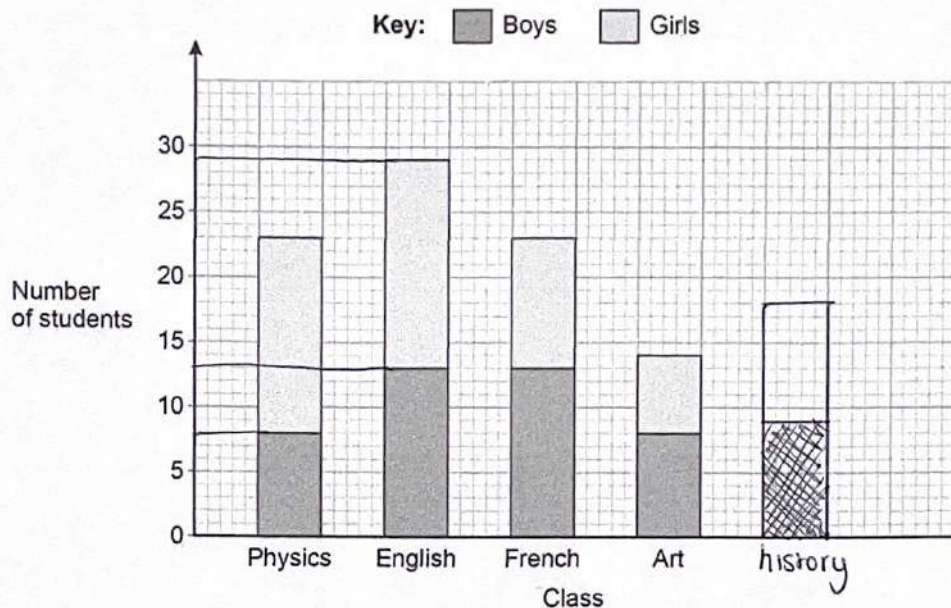
[3 marks]

70	6	
20	1400	120
4	280	24
		1400
		+ 280
		+ 120
		+ 24
		1824
		+

Answer 1824



- 6 The composite bar chart shows the number of students in some classes.



- 6 (a) How many boys are in the Physics class?

[1 mark]

Answer 8

- 6 (b) How many girls are in the English class?

[1 mark]

$$29 - 13 = 16$$

Answer 16

- 6 (c) Which **two** classes have the same total number of students?

[1 mark]

Answer Physics and French



- 6 (d) In the History class
there are 18 students
number of boys = number of girls

Show this information on the bar chart.

[2 marks]

- 7 (a) Work out $1.86 \div 6$

[1 mark]

$$\begin{array}{r} 0.31 \\ 6 \overline{) 1.86} \end{array}$$

Answer 0.31

- 7 (b) Work out 0.4×0.2

[1 mark]

Answer 0.08



8 Here are four number cards.

8.6

0.27

6.3

0.4

- 8 (a) Choose **two** of the cards to make the answer to this calculation a whole number.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} + \boxed{0.4} = \underline{9}$$

- 8 (b) Choose **two** of the cards to make the answer to this calculation as large as possible.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} - \boxed{0.27} = \underline{8.33}$$



9

Rulers
85p each

Pens
£3.50 each

Jenny buys 5 rulers and 2 pens.
She works out how much she should pay.

$$\begin{aligned} 5 \times 85p &= \text{£}4.25 \\ 2 \times \text{£}3.50 &= \text{£}6.10 \\ \text{Total} &= \text{£}10.35 \end{aligned}$$

Jenny's total is wrong.

What mistake has she made?

Include the correct total in your answer.

[2 marks]

Mistake made 2 × £3.50 is £7.00 not
£6.10

Correct total £ 11.25

Turn over for the next question

Turn over ►



10 Here are three calculations, A, B and C.

A
 $100 \times 20\,000$

B
 $1 \text{ million} \div 2$

C
 $4 \times 100\,000$

Put the calculations in order.

Start with the calculation that has the smallest answer.

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

[3 marks]

A	B	C
2,000,000	500,000	400,000

Smallest _____ C _____

_____ B _____

Largest _____ A _____



- 11 In a raffle, 200 tickets are sold.
The tickets are either red or blue.
The winning ticket is picked at random.

- 11 (a) What is the probability that the winning ticket is green?

[1 mark]

Answer 0

- 11 (b) 79 children and 90 women buy one ticket each.
Men buy the rest of the tickets.

Work out the probability that a man buys the winning ticket.

[2 marks]

$$200 - 90 - 79 = 31$$

Answer $\frac{31}{200}$

Turn over for the next question



- 12 A college has
a total of 105 teachers
19 more female teachers than male teachers.

What proportion of the teachers are female?

[3 marks]

$$x = \text{no. male teachers}$$

$$x + x + 19 = 105$$

$$2x = 86$$

$$x = 43 \quad \text{Female} = 43 + 19 = 62$$

$$\text{Answer } \frac{62}{105}$$

- 13 By rounding each number to the nearest 10, estimate the value of $262 \div 19.8$

[2 marks]

$$260 \div 20$$

$$\text{Answer } = 13$$

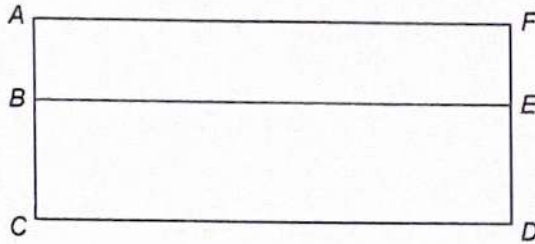


Do not write
outside the
box14 $ABEF$ and $ACDF$ are rectangles.

$AF = 10 \text{ cm}$

$AB = 2 \text{ cm}$

$BC = 4 \text{ cm}$

Not drawn
accurately

Work out

perimeter $ABEF$: perimeter $ACDF$

Give your answer in its simplest form.

[3 marks]

$$ABEF \quad 10 + 2 + 10 + 20 = 24$$

$$ACDF \quad 10 + 6 + 10 + 6 = 32$$

$$24 : 32$$

$$12 : 16$$

$$6 : 8$$

Answer 3 : 4

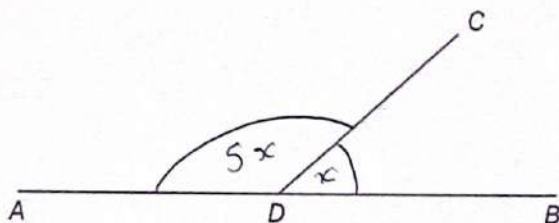
Turn over for the next question

Turn over ►



Do not write
outside the
box

- 15 ADB and CD are straight lines.

Not drawn
accurately

$$\text{angle } ADC = 5 \times \text{angle } CDB$$

Work out the size of angle ADC .

[3 marks]

$$6x = 180$$

$$x = 30$$

$$5x = 150$$

Answer 150 degrees

- 16 Circle the value of 5^3

[1 mark]

8

15

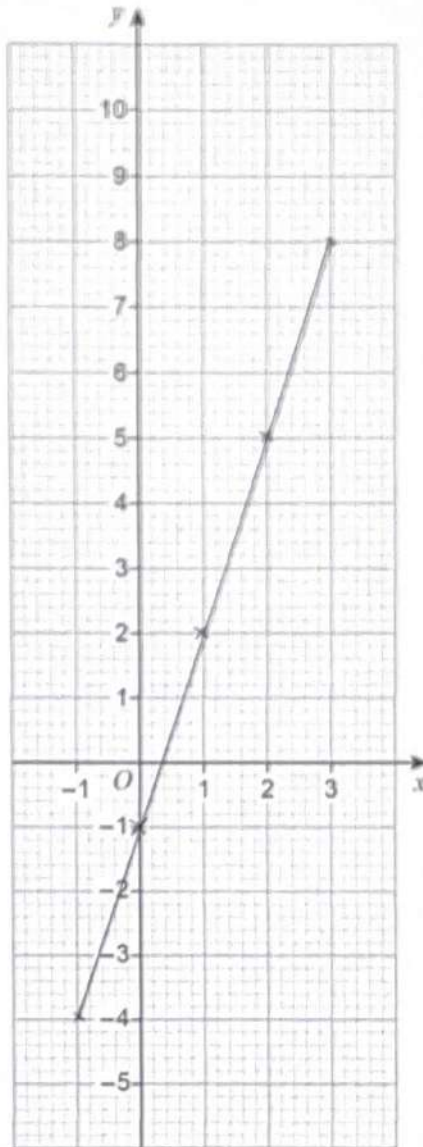
25

125



17 Draw the graph of $y = 3x - 1$ for values of x from -1 to 3

[3 marks]



- 18 Mo played 30 games of chess.
He won 18 of these games.

- 18 (a) What fraction of the games did he win?
Give your answer in its simplest form.

[2 marks]

$$\frac{18}{30} \quad \frac{9}{15} \quad \frac{3}{5}$$

Answer $\frac{3}{5}$

- 18 (b) He played 20 more games.
He had then won 64% of **all** of his games.

How many of the 20 games did he win?

[3 marks]

$$\frac{64}{100} \times (20 + 30) = 32$$

14

Answer 14



19 (a) In a field

number of sheep : number of cows = 10 : 3

Zak says,

"There are 10 sheep in the field."

Give a reason why Zak **could** be wrong.

[1 mark]

The number of sheep could be any multiple of 10

19 (b) In a different field

number of goats : number of pigs = 13 : 4

Priya says,

"There are more than three times as many goats as pigs."

Is she correct?

Tick **one** box.

Yes

No

Cannot tell

Show working to support your answer.

[1 mark]

if 4 pigs, 3 times as many goats would
be 12 but there are 13

$$\text{ie } 13 \div 4 = 3 \text{ r}1$$



20 An ordinary fair dice is rolled.

$$P(A) = \frac{5}{6}$$

Which could be a correct statement about event A?

Tick **one** box.

[1 mark]

The number rolled is even

The number rolled is greater than 1

The number rolled is less than 5

The number rolled is prime

21 Solve $8x + 7 = 2x + 10$

[3 marks]

$$8x - 2x = 10 - 7$$

$$6x = 3$$

$$x = 0.5$$

$$x = 0.5$$



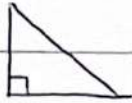
22

In a right-angled triangle

smallest angle : largest angle = 2 : 5

Work out the three angles of the triangle.

[4 marks]



largest

$$90 \div 5 = 18 \quad 18 \times 2 = 36$$

$$180 - 90 - 36 = 54$$

90

degrees

36

degrees

54

degrees

23

Which one of the following is discrete data?

Circle your answer.

[1 mark]

length of arm

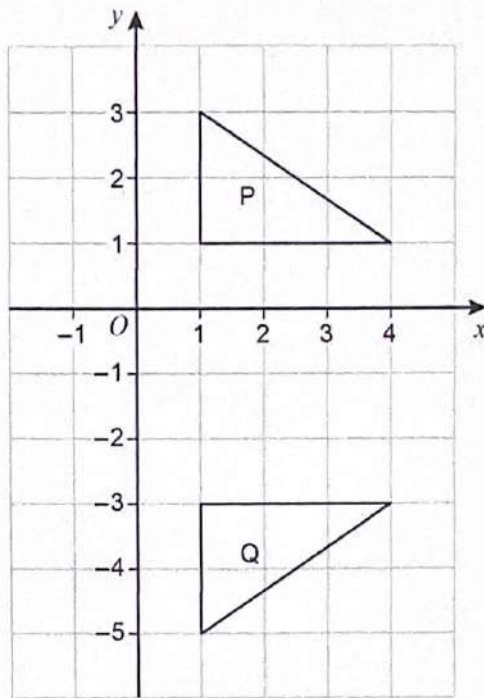
height of door

number of pets

mass of sugar



24 (a) Here are two triangles, P and Q.



Here is a statement.

A transformation that maps P to Q is a reflection in the line $x = -1$

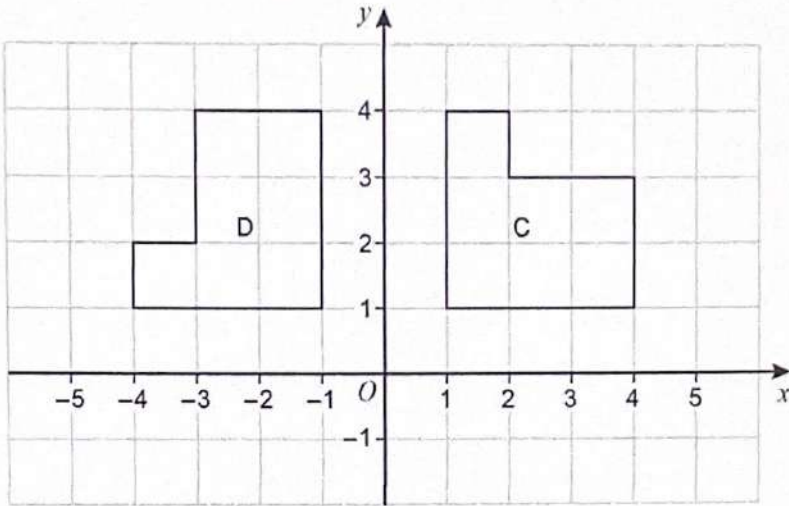
Make **one** criticism of the statement.

[1 mark]

the line should be $y = -1$



24 (b) Here are two shapes, C and D.



Here is a statement.

A transformation that maps C to D is a rotation through 90° anticlockwise.

Make **one** criticism of the statement.

[1 mark]

Should say the centre of rotation

Turn over for the next question

Turn over ►



- 25 (a) A geometric progression starts 4 16

Work out the next term.

[1 mark]

$$4^3$$

Answer 64

- 25 (b) A Fibonacci-type sequence starts 3 -8

The sequence is continued by adding the previous two terms.

Work out the next **two** terms.

[2 marks]

$$3 + -8 = -5$$

$$-8 + -5 = -13$$

Answer -5 and -13



26

Given that $a \times 60 = b$ work out the value of $\frac{4b}{a}$

[2 marks]

$$\frac{60a = b}{a} \qquad \frac{4(60a)}{a} = \frac{240a}{a}$$

Answer 240

27

Write $27 \times (3^2)^7$ as a single power of 3

[3 marks]

$$3^3 \times 3^{14} = 3^{17}$$

Answer 3^{17}

Turn over for the next question

Turn over ►

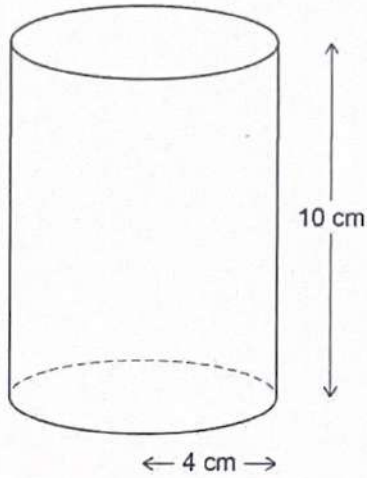


28

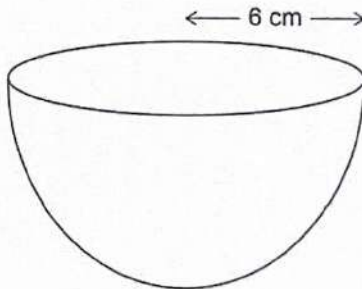
Here are two solids.

Cylinder

radius 4 cm height 10 cm

**Hemisphere**

radius 6 cm



volume of a hemisphere = $\frac{2}{3} \pi r^3$ where r is the radius



Which solid has the greater volume?

You **must** show your working.

[4 marks]

$$\text{cylinder: } 10 \times \pi r^2 = 10 \times \pi \times 4^2 \\ = 503.$$

$$\text{hemisphere: } \frac{2}{3} \pi (4)^3 = 453$$

Answer cylinder has a greater volume.

Turn over for the next question

Turn over ►



29

Saj makes Rose Pink paint and Cherry Pink paint.

He mixes red paint with white paint as shown.

Rose Pink

red : white = 1 : 2

Cherry Pink

red : white = 4 : 3

He makes 60 litres of Rose Pink paint.

To this Rose Pink paint he adds

80 litres of red paint and 28 litres of white paint.

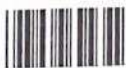
Has he now made Cherry Pink paint?

You **must** show your working.

[4 marks]

$$\begin{array}{r}
 60 \text{ L} = 20 \text{ L red} \quad 40 \text{ L white} \\
 + \quad 80 \text{ L} \quad 28 \text{ L} \\
 \hline
 = 100 \text{ L} \quad 68 \text{ L}
 \end{array}$$

No he has not made cherry pink



30 (a) Work out $\frac{2 \times 10^{14}}{8 \times 10^9}$

Give your answer in standard form.

[2 marks]

$$\begin{aligned} & \cancel{2} \quad 10^{14} \div 10^9 = 10^5 \\ & \qquad \qquad \qquad \div 4 \\ & \qquad \qquad \qquad = 25,000 \end{aligned}$$

Answer 2.5×10^4

30 (b) $6200.07 = 6.2 \times 10^c + 7 \times 10^d$

Work out the values of c and d .

[2 marks]

$c = 3$ $d = -2$

Turn over for the next question



31

$$V = \frac{k}{H} \quad \text{where } k \text{ is a constant.}$$

Which **two** statements are correct?

Tick **two** boxes.

[1 mark]

V is directly proportional to H

V is inversely proportional to H

V is directly proportional to $\frac{1}{H}$

V is inversely proportional to $\frac{1}{H}$

END OF QUESTIONS

