

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel

Level 1/Level 2 GCSE (9–1)

Centre Number

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Candidate Number

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Tuesday 19 May 2020

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/1F**

Mathematics

Paper 1 (Non-Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ➡

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P 6 2 2 7 4 R A 0 1 2 0



Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write the following numbers in order of size.

Start with the smallest number.

0.32 0.4 0.35 0.309

0.309, 0.32, 0.35, 0.4 ✓

(Total for Question 1 is 1 mark)

- 2 Here is a list of numbers.

~~8~~ ~~11~~ 18 ~~22~~ 29

From the list, write down a multiple of 3

3, 6, 9, 12, 15, 18, 21, 24, 27, 30

18 ✓

(Total for Question 2 is 1 mark)

- 3 Write 4.666 correct to the nearest whole number.

↑

↳ first decimal place (tenths)

number > 5 , round $\uparrow$

number < 5 , round $\downarrow$

∴ rounding up because

6 $>$ 5 ∴ rounded to 5

5 ✓

(Total for Question 3 is 1 mark)

- 4 Write $\frac{3}{4}$ as a decimal. $\rightarrow 3 \times \frac{1}{4} = 3 \times 0.25$

0.25

0.25

0.25

0.75

1

0.75 ✓

(Total for Question 4 is 1 mark)

- 5 Write down the value of the 7 in the number 8765

↳ 5 units
↳ 6 tens
↳ 7 hundreds
↳ 8 thousands

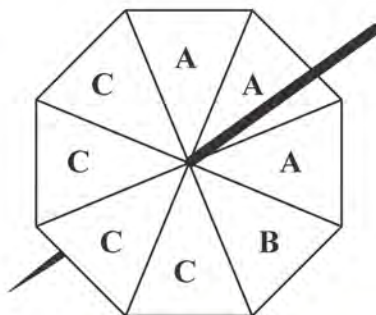
700 ✓

(Total for Question 5 is 1 mark)



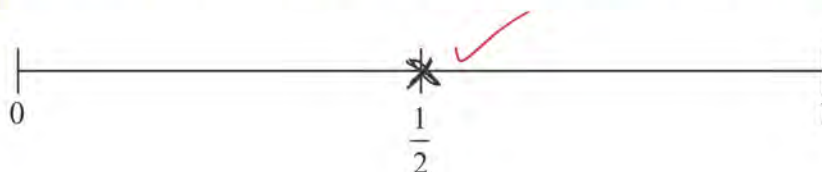
- 6 Gita spins a fair 8-sided spinner.

↳ Not biased



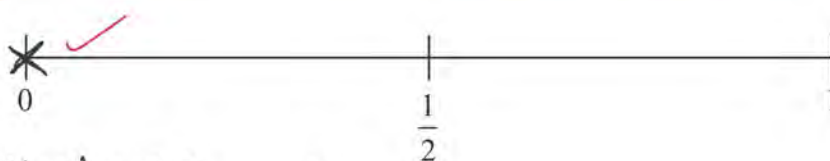
$$P(C) = \frac{\text{Number of C}}{\text{Number of options}} \\ = \frac{4}{8} = \frac{1}{2}$$

- (a) On the probability scale, mark with a cross (X) the probability that the spinner will land on C.



(1)

- (b) On the probability scale, mark with a cross (X) the probability that the spinner will land on D.



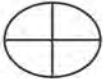
$$P(D) = \frac{\text{Number of D}}{\text{Number of options}} = \frac{0}{8} = 0$$

(1)

(Total for Question 6 is 2 marks)



- 7 The incomplete pictogram shows information about the number of eggs sold from a farm shop on Monday.

Monday	 
Tuesday	  ✓
Wednesday	   ✓

Key:  = 3 eggs ✓

On Monday the shop sold 18 eggs. $\rightarrow 6 \text{ quarter ellipses} = 18 \text{ eggs} \rightarrow 1 \text{ quarter ellipse} = 3 \text{ eggs} \checkmark$
 On Tuesday the shop sold 24 eggs.
 On Wednesday the shop sold 27 eggs.

Use this information to complete the pictogram and the key.

Tuesday: $\begin{matrix} \times 8 \\ \downarrow \end{matrix}$ $\begin{matrix} 1 \text{ quarter ellipse} \rightarrow 3 \text{ eggs} \\ 8 \text{ quarter ellipses} \rightarrow 24 \text{ eggs} \end{matrix}$ $\downarrow x? = \frac{24}{3} = 8 \therefore \times 8$

Wednesday: $\begin{matrix} \times 9 \\ \downarrow \end{matrix}$ $\begin{matrix} 1 \text{ quarter ellipse} \rightarrow 3 \text{ eggs} \\ 9 \text{ quarter ellipses} \rightarrow 27 \text{ eggs} \end{matrix}$ $\downarrow x? = \frac{27}{3} = 9 \therefore \times 9$

(Total for Question 7 is 4 marks)

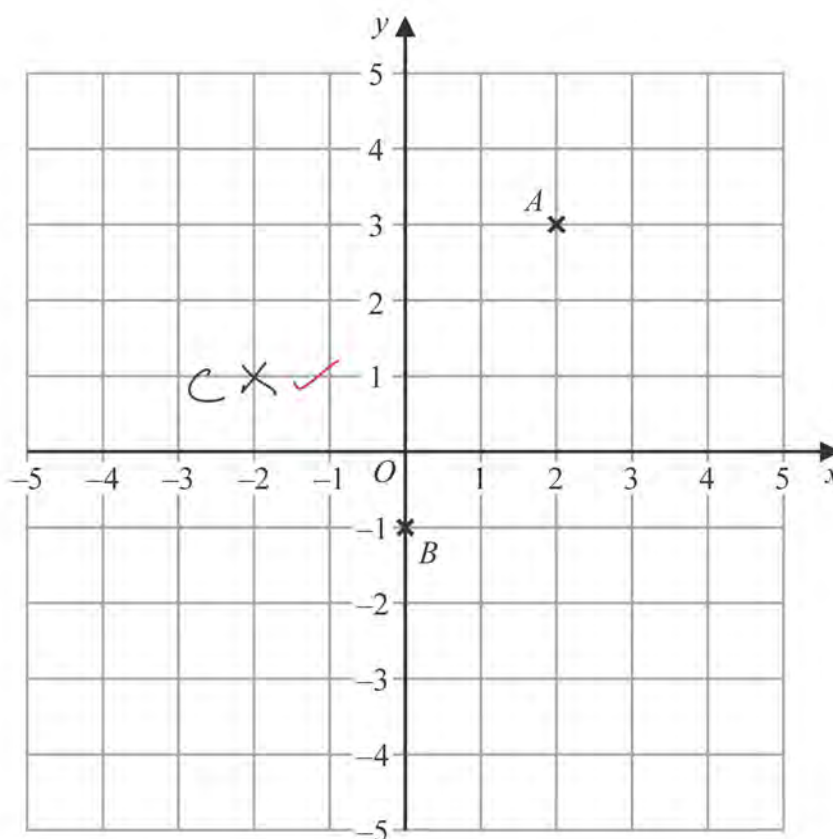
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8



(a) Write down the coordinates of the point A .

(2 , 3)
(1) ✓

(b) Write down the coordinates of the point B .

(0 , -1)
(1) ✓

(c) On the grid, mark with a cross (X) the point $(-2, 1)$
Label this point C .

(1)

(Total for Question 8 is 3 marks)



- 9 (a) A bag contains red counters and blue counters only.

number of red counters : number of blue counters = 3:4

Write down the fraction of the counters that are red.

$$\hookrightarrow \frac{\text{Number of red}}{\text{Number of counters}} = \frac{3}{3+4} = \frac{3}{7}$$

$$\frac{3}{7} \checkmark$$

(1)

- (b) Write the ratio 12:30 in the form 1:n

$$n = \frac{30}{12} \checkmark = 2.5$$

$$\begin{array}{r} 2.5 \\ 12 \overline{) 30} \\ \underline{24} \\ 60 \\ \underline{60} \\ 0 \end{array} \quad \begin{array}{c} \div 12 \quad \swarrow \quad 12:30 \\ \quad \quad \quad 1:n \quad \searrow \quad \div 12 \end{array}$$

$$1:2.5 \checkmark$$

(2)

(Total for Question 9 is 3 marks)

- 10 Jenny has 12 marbles.

$\frac{1}{4}$ of these 12 marbles are large. $\rightarrow \# \text{ Large M: } \frac{1}{4} \times 12 = 3$

The rest of these 12 marbles are small. $\rightarrow \# \text{ small M: } 12 - 3 = 9 \checkmark$

Each large marble has a weight of 70 grams.

Each small marble has a weight of 50 grams.

Work out the total weight of the 12 marbles.

$$\begin{aligned} \text{Weight of large marbles} &= \# \text{ large M} \times \text{Weight of large M} \\ &= 3 \times 70\text{g} = 210\text{g} \checkmark \end{aligned}$$

$$\begin{aligned} \text{Weight of small marbles} &= \# \text{ small M} \times \text{Weight of small M} \\ &= 9 \times 50\text{g} = 450\text{g} \end{aligned}$$

$$\begin{array}{r} + 210 \\ 450 \\ \hline 660 \end{array}$$

$$\begin{aligned} \text{Total weight} &= \text{W. Large M} + \text{W. small marbles} \\ &= 210\text{g} + 450\text{g} \checkmark \\ &= 660\text{g} \end{aligned}$$

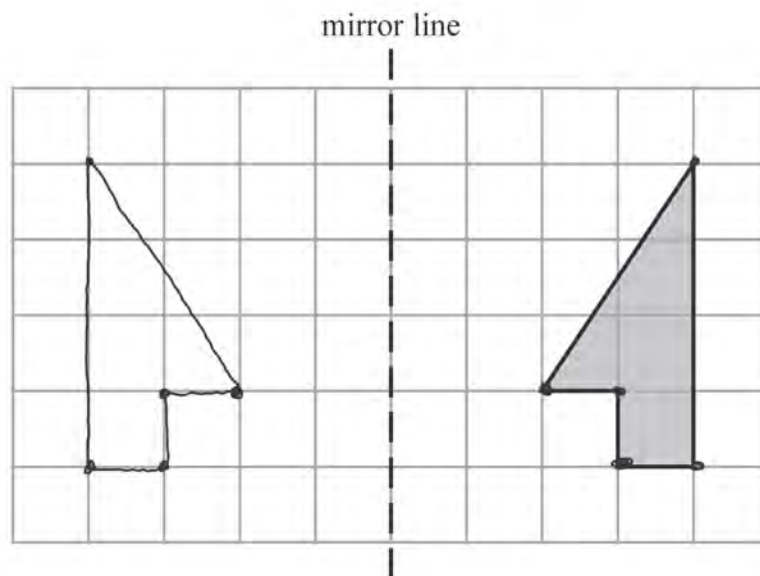
$$660 \checkmark$$

grams

(Total for Question 10 is 4 marks)



11



Reflect the shaded shape in the mirror line.

(Total for Question 11 is 2 marks)

12 The diagram shows a number machine.



(a) Find the output when the input is 7

$$7 \times 2 = 14$$

$$14 - 3 = 11$$

11 ✓
(1)

(b) Find the input when the output is 41

for an input n , output = $2n - 3$ ✓

$$41 = 2n - 3$$

$$+3 \quad \downarrow \quad 44 = 2n \quad \downarrow +3$$

$$\div 2 \quad \downarrow \quad n = \frac{44}{2} \quad \downarrow \div 2$$

$$= 22$$

22 ✓
(2)

(Total for Question 12 is 3 marks)



- 13 The diagram shows two points, A and B , on a map.

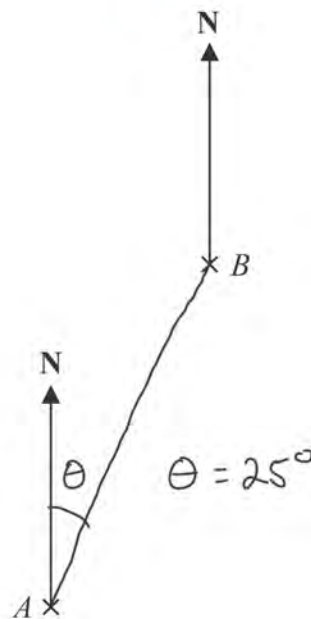


Diagram accurately drawn

length $AB = 5\text{cm}$ ✓

Scale: 1 to 25 000

- (a) Find the bearing of B from A . → Start at A and go to B .

025 ✓ °
(1)

- (b) Work out the real distance between A and B .
Give your answer in kilometres.

$\times 5 \quad \downarrow \quad 1 \rightarrow 25000$
 $5 \rightarrow 125000\text{cm}$ ✓ $\downarrow \times 5$

$\begin{array}{r} 25000 \\ \times 5 \\ \hline 125000 \end{array}$ 2

$125000\text{cm} = 1250\text{m}$

$1250\text{m} = 1.25\text{km}$

1.25 ✓ kilometres
(3)

(Total for Question 13 is 4 marks)



- 14 Ishmael asked 30 students at college to tell him the sport they each like the best from cricket or tennis or swimming.

11 of the 20 female students said swimming.

2 of the male students said tennis.

5 students said cricket.

The number of male students who said cricket was the same as the number of male students who said swimming.

Complete the two-way table.

$$\begin{aligned} x + 2 + x &= 10 & \checkmark \\ 2x + 2 &= 10 & \downarrow -2 \\ 2x &= 8 & \downarrow :2 \\ x &= 4 & \checkmark \end{aligned} \quad \begin{aligned} 1 + y + 11 &= 20 \\ 12 + y &= 20 & \downarrow -12 \\ y &= 8 & \checkmark \end{aligned}$$

	Cricket	Tennis	Swimming	Total
Male students	4	2	4	10
Female students	1	8	11	20
Total	5	10	15	30

(Total for Question is 3 marks)

- 15 Jamil makes a drink by mixing 1 part of orange squash with 9 parts of water.

He uses 750 millilitres of orange squash.

Jamil is going to put the drink he has mixed into 1 litre bottles.

Work out the greatest number of 1 litre bottles that Jamil can completely fill.

$$\begin{array}{r} \times 750 \\ 9 \\ \hline 6750 \end{array}$$

$$\begin{array}{r} 6750 \\ + 750 \\ \hline 7500 \\ 11 \end{array}$$

① how much water is used: 1000ml

$$\begin{aligned} & \times 750 \quad 1:9 \quad \downarrow \times 750 \rightarrow ? = 9 \times 750 \text{ ml} \\ & 750 \text{ ml} : 6750 \text{ ml} \checkmark \end{aligned}$$

② how much fluid/juice there is:

$$\begin{aligned} \text{Total volume} &= \text{Vol}(\text{os}) + \text{Vol}(\text{water}) = 750 \text{ ml} + 6750 \text{ ml} \\ &= 7500 \text{ ml} \checkmark \end{aligned}$$

③ how many bottles.

$$\begin{aligned} & \times 7.5 \quad 1 \text{ bottle} \rightarrow 1000 \text{ ml} \\ & 7.5 \text{ bottles} \rightarrow 7500 \text{ ml} \quad \downarrow \times ? = \frac{7500}{1000} = 7.5 \times \end{aligned}$$

↳ Round down to 7 as not enough for 8.

7 bottles ✓

(Total for Question 15 is 3 marks)



- 16 The table gives information about the number of points scored by each of 16 students in a game.

Number of points	Frequency
0	1
1	3
2	5
3	4
4	3

Tina worked out the median of the number of points scored to be 5

- (a) Explain why it is not possible for the median to be 5

The number of points only goes up to 4. ✓

(1)

Tina also worked out the total number of points scored by the 16 students in the game. Here is her working.

$$(0 \times 1) + (1 \times 3) + (2 \times 5) + (3 \times 4) + (4 \times 3) = 1 + 3 + 10 + 12 + 12 = 38$$

Tina made a mistake in her working to find the total number of points scored.

- (b) Describe the mistake that Tina made.

$0 \times 1 = 0$, not 1 as Tina has stated. ✓

(1)

(Total for Question 16 is 2 marks)

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- 17 In a shop, a TV has a normal price of £500

The shop has a sale.

On Monday, the normal price of the TV is reduced by $\frac{1}{10} \rightarrow 0.9 \times NP$ to give the sale price.

On Tuesday, the sale price of the TV is reduced by 20%

Chris wants to buy the TV.

He has £400 to spend on the TV.

Does Chris have enough money to buy the TV on Tuesday?

You must show how you get your answer.

$$\text{Sale price on Monday} = 0.9 \times £500 = \frac{9 \times £500}{10} = 9 \times 50 = £450$$

$$\text{Sale price on Tuesday} = 0.8 \times \text{SPM}$$

$$= 0.8 \times £450$$

$$= £360$$

$$\begin{array}{r} 450 \\ \times 0.8 \\ \hline 3600 \\ 0000 \\ \hline 3600 \end{array}$$

Chris has £400. $£400 < £360$

$\therefore$ Chris can afford the TV on Tuesday (Yes)

(Total for Question 17 is 5 marks)



18 Work out an estimate for

$$\frac{790 \times 289}{49}$$

↳ round to 1.s.f

$$\frac{790 \times 289}{49} \approx \frac{800 \times 300}{50} = \frac{240000}{50}$$
$$= \frac{24000}{5} \checkmark$$

$$= 4800$$

$$\begin{array}{r} 4800 \\ 5 \overline{) 24000} \\ \underline{20} \downarrow \\ 40 \downarrow \\ \underline{40} \downarrow \\ 00 \downarrow \\ 00 \downarrow \\ \underline{00} \downarrow \\ 00 \\ \underline{00} \\ 0 \end{array}$$

4800 ✓

(Total for Question 18 is 3 marks)

19 (a) Expand $x(x-4)$

$$\begin{aligned} &= x \times x + (x)(-4) \\ &= x^2 + (-4x) \\ &= x^2 - 4x \end{aligned}$$

$$x^2 - 4x \quad \checkmark$$

(b) Factorise $15y - 10$

$$\begin{array}{c} 15y \\ / \quad \backslash \\ y \quad 15 \\ \quad \quad \wedge \\ \quad \quad 35 \end{array}$$

$$\begin{array}{c} 10 \\ \wedge \\ 2 \quad 5 \end{array}$$

$$\begin{aligned} 15y &= 3 \times 5 \times y \\ 10 &= 2 \times 5 \end{aligned}$$

$\therefore \text{HCF} = 5$

$$15y - 10 = 5(3y - 2)$$

$$5(3y-2) \checkmark$$

(c) Solve $7(f-5) = 28$

$$\begin{array}{lcl} 7(f-5) = 28 & & \\ \div 7 \downarrow & f-5 = 4 & \downarrow \div 7 \checkmark \\ +5 \downarrow & f = 9 & \downarrow +5 \end{array}$$

$$f = 9 \checkmark$$

(Total for Question 19 is 4 marks)

20 The first five terms of an arithmetic sequence are

1 4 7 10 13

Write down an expression, in terms of n , for the n th term of this sequence.

1st rule: $1 \rightarrow 4 \rightarrow 7 \rightarrow 10 \rightarrow 13$
 $+3 \quad +3 \quad +3 \quad +3 \rightarrow 3n$

n	1	2	3	4	5
Term	1	4	7	10	13
$3n$	3	6	9	12	15
Term - $3n$	-2	-2	-2	-2	-2

Term - term rule is $3n - 2$

$3n - 2$ ✓✓

(Total for Question 20 is 2 marks)

21 Show that

$$2\frac{1}{3} \times 3\frac{3}{4} = 8\frac{3}{4}$$

1) Convert mixed number to improper fractions.

$$2\frac{1}{3} = \frac{7}{3} \quad \text{and} \quad 3\frac{3}{4} = \frac{15}{4} \quad \checkmark$$

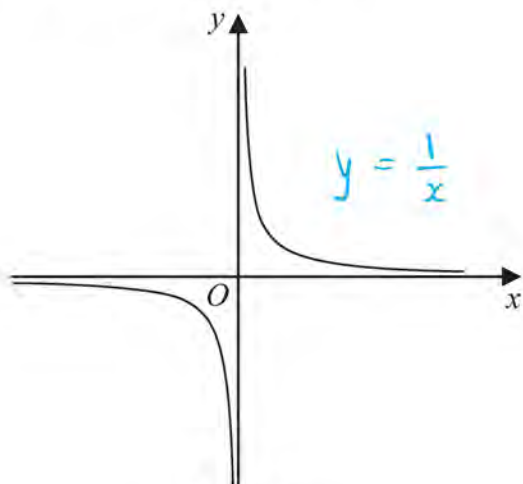
2) multiply improper fractions

$$\begin{aligned}
 2\frac{1}{3} \times 3\frac{3}{4} &= \frac{7}{3} \times \frac{15}{4} \quad \checkmark \\
 &= \frac{7 \times 5}{1 \times 4} = \frac{35}{4} \\
 &= \frac{32}{4} + \frac{3}{4} \quad \leftarrow \begin{array}{l} \text{whole number} \\ \text{fractional part} \end{array} \\
 &= 8 + \frac{3}{4} \\
 &= 8\frac{3}{4} \quad \checkmark
 \end{aligned}$$

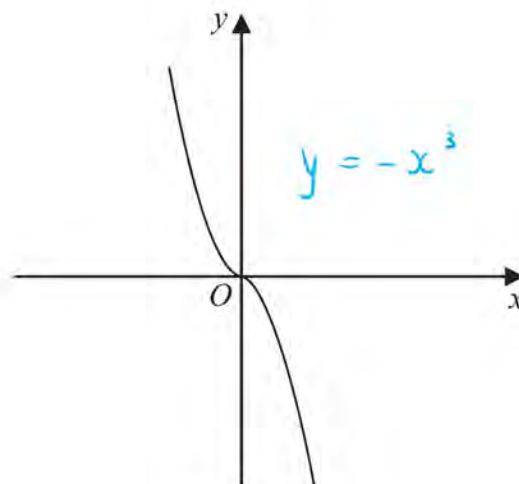
(Total for Question 21 is 3 marks)



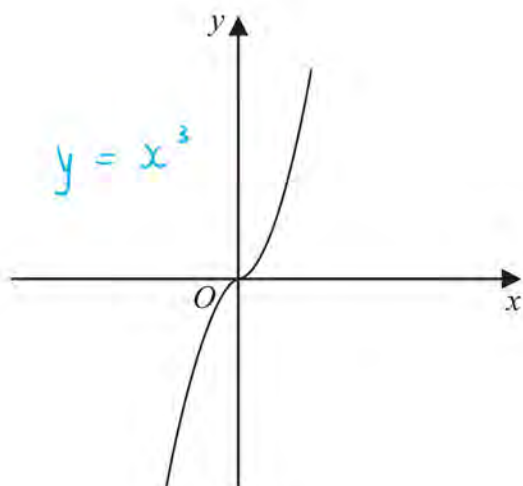
22 The diagram shows four graphs.



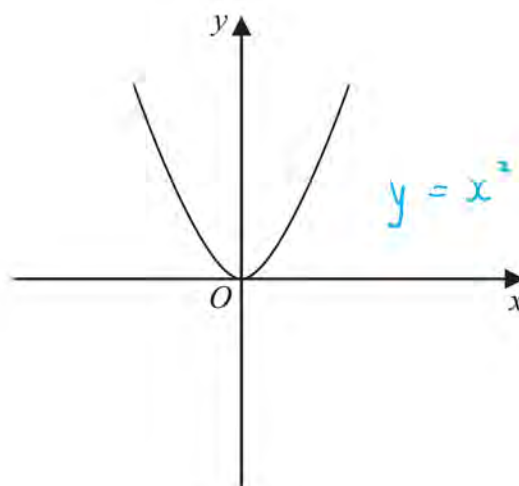
Graph A



Graph B



Graph C

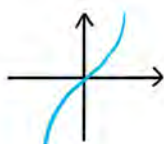


Graph D

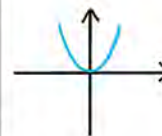
Each of the equations in the table is the equation of one of the graphs.

Complete the table.

①
①



Equation	Letter of graph
$y = -x^3$	B
$y = x^3$	C
$y = x^2$	D
$y = \frac{1}{x}$	A



(Total for Question 22 is 2 marks)

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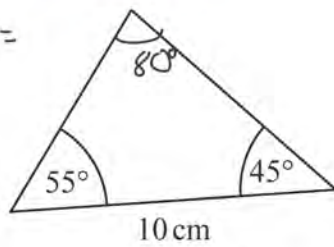
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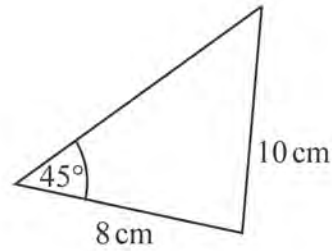


23 The diagram shows four triangles.

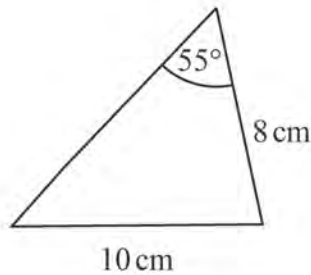
$$180 - 55 - 45 =$$



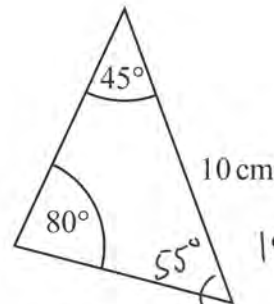
Triangle A



Triangle B



Triangle C



Triangle D

$$180 - 80 - 45 = 55$$

Two of these triangles are congruent. $\rightarrow$ Same

Write down the letters of these two triangles.

A and D ✓

(Total for Question 23 is 1 mark)

24 Sean pays £10 for 24 chocolate bars.

He sells all 24 chocolate bars for 50p each.

Work out Sean's percentage profit.

$$\text{Revenue (how much he made)} = 24 \times £0.50 = £12 \checkmark$$

$$\% \text{ Profit} = \frac{\text{Revenue} - \text{cost}}{\text{cost}} \times 100 = \frac{£12 - £10}{£10} \times 100 \checkmark$$

$$= \frac{£2}{£10} \times 100 = 0.2 \times 100 = 20\%$$

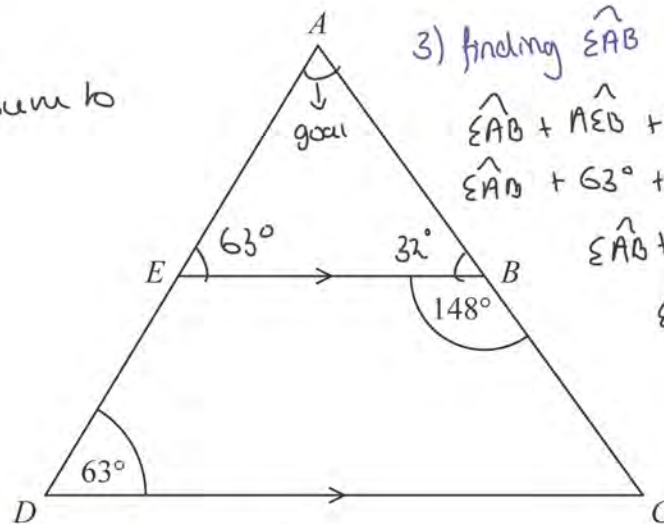
20 ✓ %

(Total for Question 24 is 3 marks)



25 ADC is a triangle.

Angles in a triangle sum to 180° . ✓₅



3) finding $\hat{EAB}$

$$\hat{EAB} + \hat{AEB} + \hat{ABE} = 180^\circ$$

$$\hat{EAB} + 63^\circ + 32^\circ = 180^\circ \quad \checkmark_2$$

$$\hat{EAB} + 95^\circ = 180^\circ$$

$$\hat{EAB} = 180^\circ - 95^\circ = 85^\circ$$

AED and ABC are straight lines.

EB is parallel to DC .

Angle $EBC = 148^\circ$

Angle $ADC = 63^\circ$

Work out the size of angle EAB .

You must give a reason for each stage of your working.

1) finding angle $\hat{AEB}$.

$\hat{AEB}$ and $\hat{ADC}$ are corresponding angles (AE is on the line AED and EB and DC are parallel).

$$\hookrightarrow \hat{AEB} = \hat{ADC} \rightarrow \hat{AEB} = 63^\circ \quad \checkmark_1$$

2) finding angle $\hat{ABE}$.

Line ABC is a straight line, and angles on a line sum to 180° ✓₄

$$\hat{ABE} + \hat{EBC} = 180^\circ$$

$$148^\circ \quad \hat{ABE} + 148^\circ = 180^\circ \quad \downarrow -148^\circ$$

$$\hat{ABE} = 180^\circ - 148^\circ$$

$$\hat{ABE} = 32^\circ \quad \checkmark_2$$

$$\therefore \hat{EAB} = 85^\circ \quad \checkmark_3$$

(Total for Question 25 is 5 marks)



26 The table shows information about the heights, in cm, of a group of Year 9 girls.

least height	150 cm
median	165 cm
greatest height	170 cm

$$\text{Range} = 170\text{cm} - 150\text{cm} \\ = 20\text{cm} \checkmark$$

This stem and leaf diagram shows information about the heights, in cm, of a group of 15 Year 9 boys.

15	8 9 9
16	4 5 7 7 8
17	0 3 4 4 7
18	0 2

$$\text{Median position} = \frac{15+1}{2} = 8$$

$$\text{range} = 182\text{cm} - 158\text{cm} \\ = 24\text{cm}$$

$$\text{Median} = 168\text{cm}$$

Key: 15 | 8 represents 158 cm

→ Median and range

Compare the distribution of the heights of the girls with the distribution of the heights of the boys.

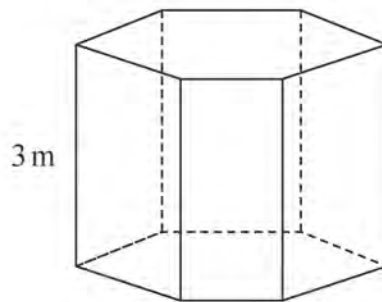
Median height for girls is less than median height for boys
(165 < 168) ✓

Range for girls is less than the range for boys (20 < 24) ✓

(Total for Question 26 is 3 marks)



27 The diagram shows a prism placed on a horizontal floor.



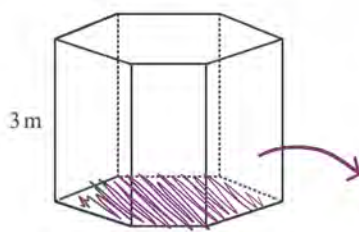
$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The prism has height 3 m

The volume of the prism is 18 m^3

The pressure on the floor due to the prism is 75 newtons/m^2

Work out the force exerted by the prism on the floor.



$$\text{pressure} = \frac{\text{force}}{\text{cross-sectional area}}$$

cross-sectional area

Work out cross-sectional area:

$$\text{cross-sectional area} = \frac{\text{volume}}{\text{height}} = \frac{18}{3} = 6 \text{ m}^2$$

Work out force:

450 newtons

(Total for Question 27 is 3 marks)

$$\text{pressure} = \frac{\text{force}}{\text{cross-sectional area}}$$

$$75 = \frac{\text{force}}{6}$$

$$\therefore \text{force} = 75 \times 6 = \underline{\underline{450 \text{ N}}}$$

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- 28 Write these numbers in order of size.
Start with the smallest number.

Standard form: $A \times 10^n$ ($1 \leq A < 10$)

$$6.72 \times 10^5$$

$$67.2 \times 10^{-4}$$

$$672 \times 10^4$$

$$0.000672$$

(3)

$$6.72 \times 10 \times 10^{-4}$$

$$6.72 \times 100 \times 10^4$$

$$6.72 \times 10^{-4}$$

$$6.72 \times 10^{-3}$$

$$6.72 \times 10^6$$

(1)

(2)

(4)

$$0.000672$$

$$67.2 \times 10^{-4}$$

$$6.72 \times 10^5$$

$$672 \times 10^4$$

(Total for Question 28 is 2 marks)



29 Given that $\frac{a}{b} = \frac{2}{5}$ and $\frac{b}{c} = \frac{3}{4}$

find $a:b:c$

$$a:b = 2:5 \quad b:c = 3:4 \checkmark$$

$$a:b:c$$

to find b, $\text{LCM}(5,3) = 15$

$$\begin{array}{ccc} a:b & & b:c \\ \begin{array}{l} \times 3 \downarrow \\ 2:5 \\ 6:15 \end{array} & \begin{array}{l} \downarrow \times 3 \quad \times 5 \downarrow \\ 3:4 \\ 15:20 \end{array} & \begin{array}{l} \downarrow \times 5 \\ \checkmark \end{array} \end{array}$$

$$6:15:20 \checkmark$$

(Total for Question 29 is 3 marks)



30 (a) Make q the subject of $p = 6q + 7$

$$\begin{array}{l}
 p = 6q + 7 \\
 -7 \quad \downarrow \quad -7 \\
 p - 7 = 6q \\
 \div 6 \quad \downarrow \quad \div 6 \\
 q = \frac{p-7}{6}
 \end{array}$$

$$q = \frac{p-7}{6} \quad (2) \quad \checkmark$$

(b) Simplify $(m^{-2})^{-3}$

$$\begin{aligned}
 (a^x)^y &= a^{xy} \\
 (m^{-2})^{-3} &= m^{(-2)(-3)} \\
 &= m^6
 \end{aligned}$$

$$m^6 \quad (1) \quad \checkmark$$

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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