

Write your name here

Surname

Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9-1)

Centre Number

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Candidate Number

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Mathematics

Paper 1 (Non-Calculator)

Foundation Tier

Thursday 2 November 2017 – Morning
Time: 1 hour 30 minutes

Paper Reference

1MA1/1F

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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Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 (a) Change 365 cm into metres.

$\times 365 \left(\begin{array}{l} 100 \text{ cm} = 1 \text{ m} \\ \rightarrow 365 \text{ cm} = 3.65 \end{array} \right) \times 3.65$

..... 3.65 m
(1)

- (b) Change 2.7 kg into grams.

$\times 2.7 \left(\begin{array}{l} 1000 \text{ g} = 1 \text{ kg} \\ \rightarrow 2.7 \text{ kg} = 2700 \text{ g} \end{array} \right) \times 2.7$

..... 2700 g
(1)

(Total for Question 1 is 2 marks)

- 2 Work out $2 + 7 \times 10$

$2 + (7 \times 10)$ ← BIDMAS so \times first

$2 + 70 = 72$

..... 72

(Total for Question 2 is 1 mark)

- 3 Solve $\frac{y}{4} = 10.5$

$\times 4 \quad \frac{y}{4} = 10.5$

$y = 10.5 \times 4$

$= 42$

$\begin{array}{r} 10.5 \\ \times 4 \\ \hline 42.0 \end{array}$

$y =$ 42

(Total for Question 3 is 1 mark)

- 4 Here are four numbers.

-9 -2 2 9

Write one of these numbers in each box to make a correct calculation.

$\boxed{-9} + \boxed{2} = \frac{-7}{\cancel{2}}$ one number should be neg

(Total for Question 4 is 1 mark)

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5 Here are the first four terms of a number sequence.

2 5 11 23

The rule to continue this sequence is

multiply the previous term by 2 and then add 1

Work out the 5th term of this sequence.

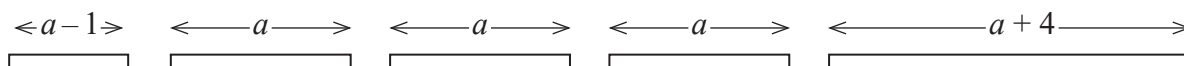
$$\begin{aligned}
 5^{\text{th}} \text{ term} &= 4^{\text{th}} \text{ term} \times 2 + 1 \\
 &= 23 \times 2 + 1 \\
 &= 46 + 1 = 47
 \end{aligned}$$

47

$$\begin{array}{r}
 23 \\
 \times 2 \\
 \hline
 46
 \end{array}$$

(Total for Question 5 is 1 mark)

6 Here are five straight rods.



All measurements are in centimetres.

The total length of the five rods is L cm.

Find a formula for L in terms of a .

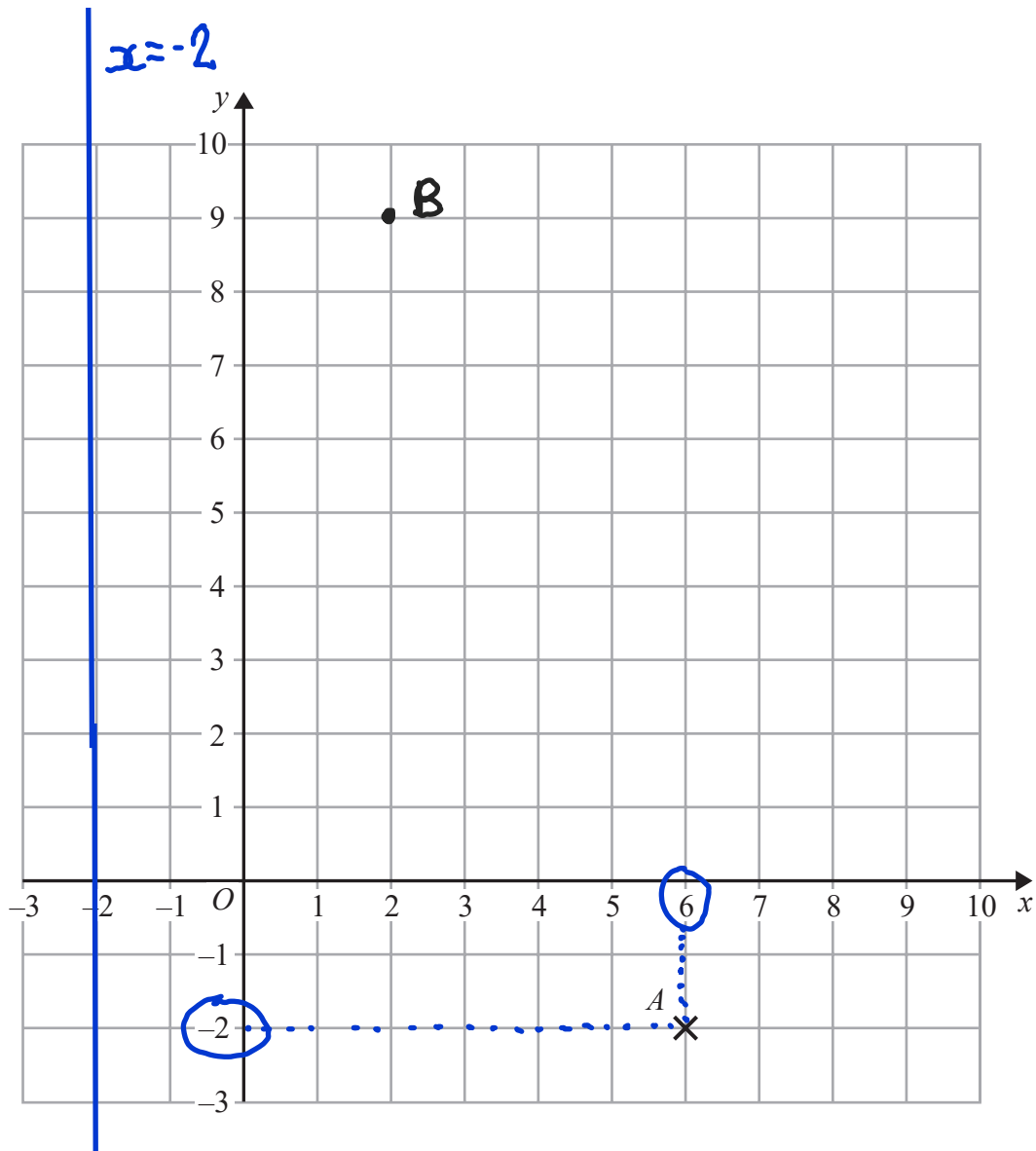
Write your formula as simply as possible.

$$\begin{aligned}
 L &= \underline{a-1} + \underline{a} + \underline{a} + \underline{a} + \underline{a+4} \\
 L &= 5a + 3
 \end{aligned}$$

5a+3

(Total for Question 6 is 3 marks)





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

$$(x, y)$$

$$x = 6$$

$$y = -2$$

$$(6, -2)$$

(1)



- (b) (i) Plot the point with coordinates (2, 9).
Label this point B. ✓

(1)

- (ii) Does point B lie on the straight line with equation $y = 4x + 1$?
You must show how you get your answer.

$$x = 2$$

$$y = 4 \times 2 + 1$$

$$y = 8 + 1 = 9$$

Yes, B lies on line $y = 4x + 1$ because
the y values are the same

(1)

- (c) On the grid, draw the line with equation $x = -2$

(1)

(Total for Question 7 is 4 marks)

- 8 The length of a rectangle is twice as long as the width of the rectangle.
The area of the rectangle is 32 cm^2 .

Draw the rectangle on the centimetre grid.

$$l = 2w$$

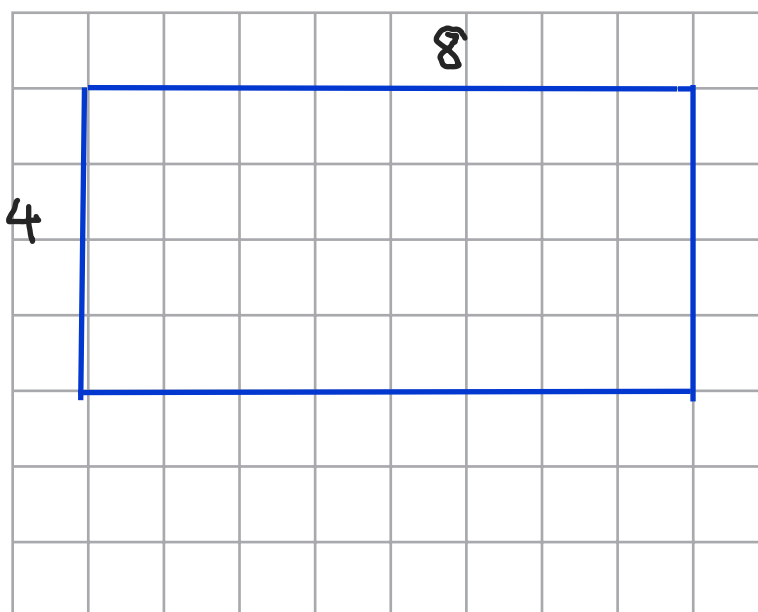
$$\text{area} = l \times w$$

$$32 = 2w \times w$$

$$2w^2 = 32$$

$$w^2 = 16$$

$$w = 4$$



(Total for Question 8 is 2 marks)



9 Jacqui wants to work out $3480 \div 5$

She knows that $3480 \div 10 = 348$

Jacqui writes $3480 \div 5 = 174$

because $10 \div 5 = 2$

and $348 \div 2 = 174$

What mistake did Jacqui make in her method?

$$\frac{3480}{10} \times 2 = \frac{3480}{5}$$

She should have multiplied by 2 instead of dividing by 2.

(Total for Question 9 is 1 mark)

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10 Jake and Sarah each played a computer game six times.

Their scores for each game are shown below.

Jake	10	9	8	11	12	8
Sarah	2	10	7	14	4	10

Range $\left\{ \begin{array}{l} \text{highest} \\ \text{lowest} \end{array} \right.$
 $12 - 8 = 4$
 $14 - 2 = 12$

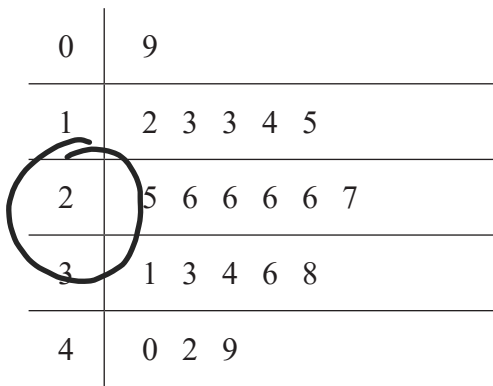
- (a) Who had the most consistent scores, Jake or Sarah?
 You must give a reason for your answer.

Jake's range is smaller and less spread out
 so his scores are more consistent.

(1)

Jake played a different game 20 times.

The stem and leaf diagram shows information about his scores.



Key
 1 | 2 represents 12 points

Jake said his modal score was 6 points because 6 occurs most often in the diagram.

- (b) Is Jake correct?
 You must explain your answer.

26 should be the modal score - he has not
 looked at the stem of the diagram.

(1)

(Total for Question 10 is 2 marks)



11 There are 30 children in a nursery school.
 At least 1 adult is needed for every 8 children in the nursery.

(a) Work out the least number of adults needed in the nursery.

$$30 \div 8 = 3 \text{ remainder } 6$$

8, 16, 24, 32 so would need 4 adults
 (round up) 4 adults
 (2)

2 more children join the nursery.

(b) Does this mean that more adults are needed in the nursery?
 You must give a reason for your answer.

$30 + 2 = 32$ $\frac{32}{8} = 4$
 No, more adults are not needed
 (1)

(Total for Question 11 is 3 marks)

12 Emma has 45 rabbits.

30 of the rabbits are male.
 8 of the female rabbits have short hair.
 12 of the rabbits with long hair are male.

(a) Use the information to complete the two-way table.

$15 - 8 = 7$

	Male	Female	Total
Long hair	12	7	19
Short hair	18	8	26
Total	30	15	45

$45 - 30 = 15$

$12 + 7 = 19$
 $18 + 8 = 26$

(3)

One of Emma's rabbits is chosen at random.

(b) Write down the probability that this rabbit is a female with short hair.

$\frac{8}{45}$ ← F with short hair
 $\frac{8}{45}$ ← total no of rabbits
 (1)

(Total for Question 12 is 4 marks)



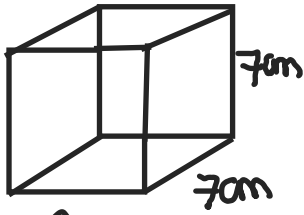
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13 The total surface area of a cube is 294 cm^2 .

Work out the volume of the cube.



↑
cube has
6 faces

$$\begin{aligned} 1 \text{ face area} &= 294 \text{ cm}^2 \div 6 \\ &= \frac{294}{6} = 49 \text{ cm}^2 \end{aligned}$$

$$\text{length of 1 side} = \sqrt{49} = 7$$

$$\begin{aligned} \text{Volume of cube} &= 7 \times 7 \times 7 \\ &= 49 \\ &\quad \times 7 \\ &\quad \hline &= 343 \end{aligned}$$

$$\dots\dots\dots 343 \text{ cm}^3$$

(Total for Question 13 is 4 marks)

14 Here are two fractions.

$$\frac{7}{5}$$

$$\frac{5}{7}$$

Work out which of the fractions is closer to 1
You must show all your working.

$$\frac{7}{5} = \frac{49}{35}$$

and

$$\frac{5}{7} = \frac{25}{35}$$

$$1 = \frac{35}{35}$$

$$\begin{array}{r} 49 - 35 = 14 \\ \underline{35} \\ 14 \end{array}$$

⋮
⋮
⋮
⋮
⋮

$$\begin{array}{r} 35 - 25 = 10 \\ \underline{35} \\ 10 \end{array}$$

$$\frac{14}{35} > \frac{10}{35}$$

∴ $\frac{5}{7}$ is closer to 1

(Total for Question 14 is 3 marks)



- 15 There are only red buttons, yellow buttons and orange buttons in a jar.
The number of red buttons, the number of yellow buttons and the number of orange buttons are in the ratio 7:4:9

Work out what percentage of the buttons in the jar are orange.

$$R : Y : O$$

$$7 : 4 : 9$$

$$\begin{aligned} \% \text{ of orange} &= \frac{9}{7+4+9} \times 100 = \frac{9}{20} \times 100 \\ &= 45\% \end{aligned}$$

total counters in bag \rightarrow

45%

(Total for Question 15 is 2 marks)

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16 Berenika wants to buy 35 T-shirts.

Each T-shirt costs £5.80

Berenika does the calculation $40 \times 6 = 240$ to estimate the cost of 35 T-shirts.

(a) Explain how Berenika's calculation shows the actual cost will be less than £240

She rounded up the number of T-shirts and the cost of each T-shirt. Therefore £240 is an overestimate.

(1)

There is a special offer.

T-shirts £5.80 each.

Buy 30 or more T-shirts.

Get 10% off the total cost.

(b) Work out the actual cost of buying 35 T-shirts using the special offer.

$$\begin{array}{r} 5.8 \\ \times 35 \\ \hline 29.0 \\ 1,74.0 \\ \hline 203.0 \end{array}$$

35 T-shirts cost £203

10% off of £203

$$10\% \text{ of } £203 = £20.30$$

(÷ 10)

$$\begin{array}{r} \overset{1}{£} \overset{2}{203}.00 \\ - \quad 20.30 \\ \hline 182.70 \end{array}$$

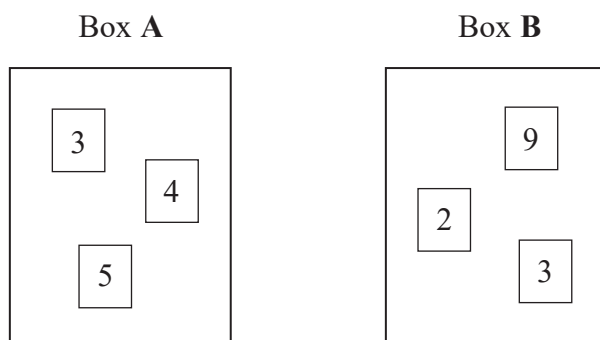
£182.70

(4)

(Total for Question 16 is 5 marks)



17 There are 3 cards in Box A and 3 cards in Box B.
There is a number on each card.



Ryan takes at random a card from Box A and a card from Box B.
He adds together the numbers on the two cards to get a total score.

Work out the probability that the total score is an odd number.

		Box A			
		3	4	5	
Box B	2	5 <i>odd</i>	6	7 <i>odd</i>	<i>9 out of 9 corres</i>
	3	6	7 <i>odd</i>	8	
	9	12	13 <i>odd</i>	14	
					<i>4</i> <i>9</i>

4 odd possibilities

(Total for Question 17 is 2 marks)



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18 Harry, Regan and Kelan share £450 in the ratio 2 : 5 : 3

How much money does Kelan get?

	H	R	K	Total
	2	5	3	10
↙ 45 ↘	90	225	135	450 ↘

$\begin{array}{r} 2 \\ 45 \\ \times 5 \\ \hline 225 \end{array}$	$\begin{array}{r} 45 \\ \times 3 \\ \hline 135 \end{array}$	<p style="text-align: right;">£ 135</p>
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(Total for Question 18 is 2 marks)

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19 Here is a list of ingredients for making 16 flapjacks.

Ingredients for 16 flapjacks

- 120 g butter
- 140 g brown sugar
- 250 g oats
- 2 tablespoons syrup

Jenny wants to make 24 flapjacks.

Work out how much of each of the ingredients she needs.

$$\frac{24}{16} = \frac{3}{2} \times = \text{amount of each ingredient to make 24 flapjacks}$$

Butter $120 \times 1.5 = 180\text{g}$

Sugar $140 \times 1.5 = 210\text{g}$

Oat $250 \times 1.5 = 375\text{g}$

Syrup $2 \times 1.5 = 3\text{tbsp}$

butter	180	g
brown sugar	210	g
oats	375	g
syrup	3	tablespoons

(Total for Question 19 is 3 marks)

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20 Ami and Josh use a calculator to work out $\frac{595}{4.08^2 + 5.3}$

Ami's answer is 27.1115

Josh's answer is 271.115

One of these answers is correct.

Use approximations to find out which answer is correct.

$$\begin{aligned} 595 &\approx 600 \\ 4.08 &\approx 4 \\ 5.3 &\approx 5 \end{aligned}$$

$$\frac{600}{4^2 + 5} = \frac{600}{16 + 5} = \frac{600}{21} \approx \frac{600}{20} \approx 30$$

answer should be around 30
so Ami is correct

(Total for Question 20 is 3 marks)

21 Work out $\frac{0.06 \times 0.0003}{0.01}$

Give your answer in standard form.

$$\begin{aligned} \frac{6 \times 10^{-2} \times 3 \times 10^{-4}}{1 \times 10^{-2}} &= \frac{18 \times 10^{-6}}{1 \times 10^{-2}} \\ &= 18 \times \frac{10^{-6}}{10^{-2}} = 18 \times 10^{-4} \\ &= 1.8 \times 10^{-3} \end{aligned}$$

between 1-10 1.8×10^{-3}

$-6 - -2 = -4$

(Total for Question 21 is 3 marks)

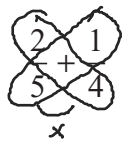


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22 (a) Work out



$$\frac{8+5}{20} = \frac{13}{20}$$

$$\frac{13}{20}$$

(2)

(b) Write down the value of 2^{-3}

$$2^3 = 8 \quad (2 \times 2 \times 2)$$

$$2^{-3} = \frac{1}{8}$$

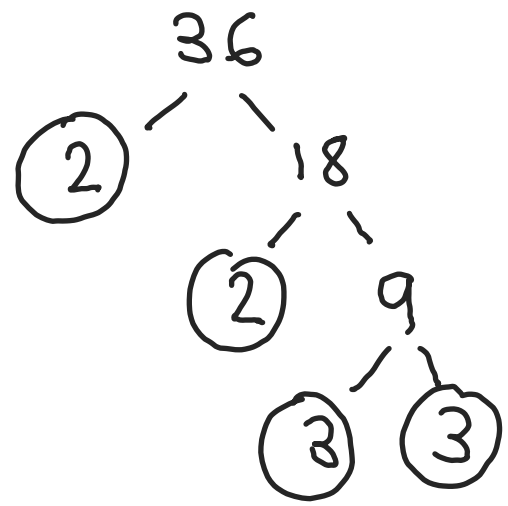
neg power = reciprocal

$$\frac{1}{8}$$

(1)

(Total for Question 22 is 3 marks)

23 Write 36 as a product of its prime factors.



$$2 \times 2 \times 3 \times 3$$

$$2^2 \times 3^2$$

$$2 \times 3^2$$

(Total for Question 23 is 2 marks)



- 24 Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77

1
2
3

Find the ratio of Jay's age to Kiaria's age to Martha's age.

$$\textcircled{1} \quad K = J + 7 \quad \therefore J = K - 7$$

$$\textcircled{2} \quad M = 2K$$

$$\textcircled{3} \quad K + J + M = 77$$

$$K + K - 7 + 2K = 77$$

$$4K - 7 = 77$$

$$4K = 84$$

$$K = 21$$

$$M = 21 \times 2 = 42$$

$$J = 21 - 7 = 14$$

$$J : K : M$$

$$14 : 21 : 42$$

$$14 : 21 : 42$$

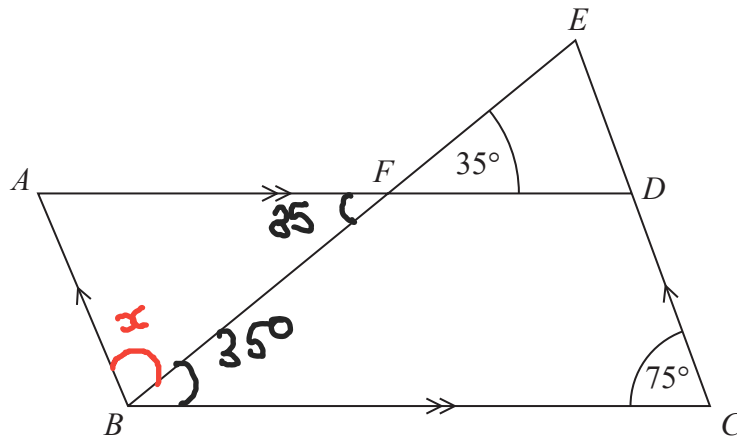
(Total for Question 24 is 4 marks)

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$ABCD$ is a parallelogram.

EDC is a straight line.

F is the point on AD so that BFE is a straight line.

Angle $EFD = 35^\circ$

Angle $DCB = 75^\circ$

Show that angle $ABF = 70^\circ$

Give a reason for each stage of your working.

$$\angle AFB = 35^\circ$$

$$\angle FBC = 35^\circ$$

$$\begin{aligned} \angle ABC &= 180 - 75 \\ &= 105^\circ \end{aligned}$$

$$\begin{aligned} \angle ABF &= \angle ABC - \angle FBC \\ &= 105 - 35 \\ &= 70^\circ \end{aligned}$$

opposite angles are equal

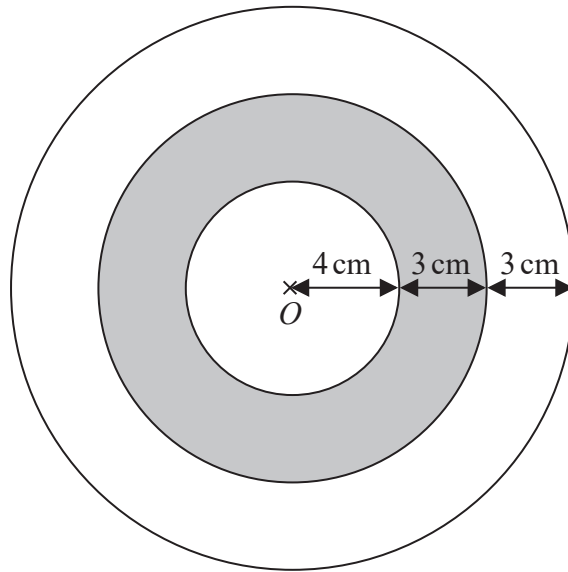
alternate angles (Z)
are equal

cointerior angles
add up to 180°

(Total for Question 25 is 4 marks)



26 The diagram shows a logo made from three circles.



Each circle has centre O .

Daisy says that exactly $\frac{1}{3}$ of the logo is shaded.

Is Daisy correct?

You must show all your working.

$$\begin{aligned} \text{Radius of full circle} &= 4 + 3 + 3 = 10 \\ \text{Area} &= 10^2 \times \pi = 100\pi \end{aligned}$$

$$\begin{aligned} \text{Area of circle with radius 4} \\ &= 4^2 \times \pi = 16\pi \end{aligned}$$

$$\begin{aligned} \text{Area of circle with radius } 4 + 3 \text{ (7cm)} \\ &= 7^2 \times \pi = 49\pi \end{aligned}$$

$$\text{Area of shaded region} = 49\pi - 16\pi = 33\pi$$

$$\text{fraction of shaded} = \frac{33\pi}{100\pi} \neq \frac{1}{3}$$

Daisy is not correct

(Total for Question 26 is 4 marks)



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27 The table shows information about the weekly earnings of 20 people who work in a shop.

Weekly earnings (£ x)	Frequency	Midpoint	$F \times mp$
$150 < x \leq 250$	1	200	200
$250 < x \leq 350$	11	300	3300
$350 < x \leq 450$	5	400	2000
$450 < x \leq 550$	0	500	0
$550 < x \leq 650$	3	600	1800
Total		20	7300

(a) Work out an estimate for the mean of the weekly earnings.

$$\text{Mean} = \frac{\sum(f \times mp)}{\sum f} = \frac{7300}{20}$$

$$2 \overline{) 7300}$$

£ 365
(3)

Nadiya says,

“The mean may **not** be the best average to use to represent this information.”

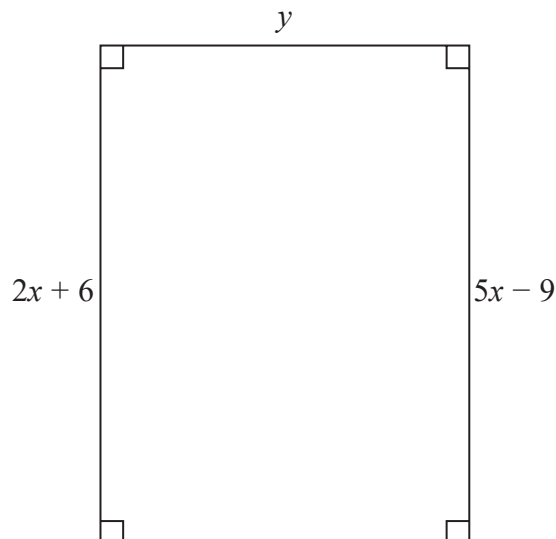
(b) Do you agree with Nadiya?
You must justify your answer.

Yes, because the 3 values in $550 < x \leq 650$ group are outliers as they are far from the modal group. This may skew the mean. (1)

(Total for Question 27 is 4 marks)



28 Here is a rectangle.



All measurements are in centimetres.

The area of the rectangle is 48 cm^2 .

Show that $y = 3$

$$2x + 6 = 5x - 9$$

$$6 = 3x - 9$$

$$15 = 3x$$

$$x = 5$$

$$\begin{aligned} \text{length} &= 2x + 6 \\ &= 2 \times 5 + 6 \\ &= 16 \text{ cm} \end{aligned}$$

$$\text{Area} = l \times w$$

$$48 = 16 \times y$$

$$3 = y$$

$$\therefore y = 3$$

(Total for Question 28 is 4 marks)

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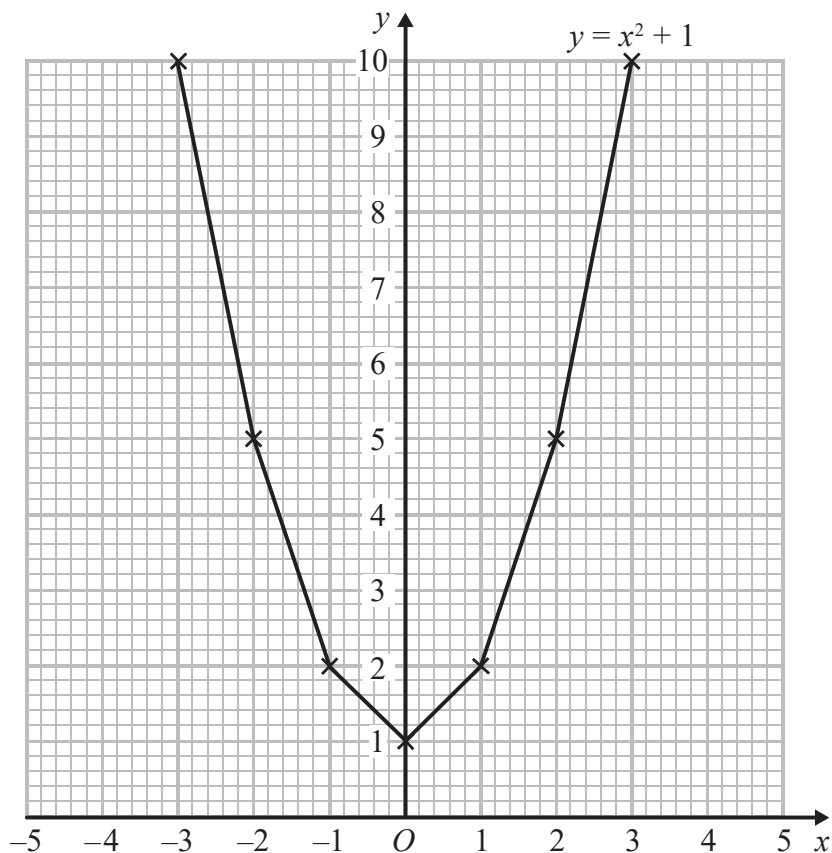
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29 Brogan needs to draw the graph of $y = x^2 + 1$

Here is her graph.



Write down one thing that is wrong with Brogan's graph.

The graph line should be a smooth curve.

(Total for Question 29 is 1 mark)



- 30 In a sale, the normal price of a book is reduced by 30%.
The sale price of the book is £2.80

Work out the normal price of the book.

$$100\% - 30\% = 70\%$$

$$\begin{array}{l} \div 7 \left(\right) 2.80 = 70\% \quad \left(\right) \div 7 \\ \quad \quad \quad 0.4 = 10\% \\ \times 10 \left(\right) \pounds 4 \quad \quad \quad 100\% \quad \left(\right) \times 10 \\ \quad \quad \quad \uparrow \\ \quad \quad \quad \text{original price} \end{array}$$

£ 4

(Total for Question 30 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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