

Write your name here

Surname	Other names
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Pearson Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number

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Candidate Number

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Mathematics

Paper 3 (Calculator)

Foundation Tier

Specimen Papers Set 1

Time: 1 hour 30 minutes

Paper Reference

1MA1/3F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

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.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

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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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write the number 5689 correct to the nearest thousand.

$6 > 5$
round up

6000

(Total for Question 1 is 1 mark)

- 2 Work out $\frac{30+12}{5+3} = \frac{42}{8} = 42 \div 8 = 5.25$

5.25

(Total for Question 2 is 1 mark)

- 3 Work out the reciprocal of 0.125 $\leftarrow \frac{1}{8}$
 \uparrow
number

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

8

(Total for Question 3 is 1 mark)

- 4 Here is a list of numbers.

1 2 5 6 12

From the list, write down

- (i) a multiple of 4 - in the 4 times tables

$$4 \times 3 = 12$$

12

- (ii) a prime number \curvearrowright

a number only
divisible by 1 and itself

2
or 5

(Total for Question 4 is 2 marks)

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- 5 There are 1.5 litres of water in a bottle.
There are 250 millilitres of water in another bottle.
Work out the total amount of water in the two bottles.

$$1.5 \text{ l} = 1500 \text{ ml}$$

↖
x1000

$$1500 + 250 = 1750$$

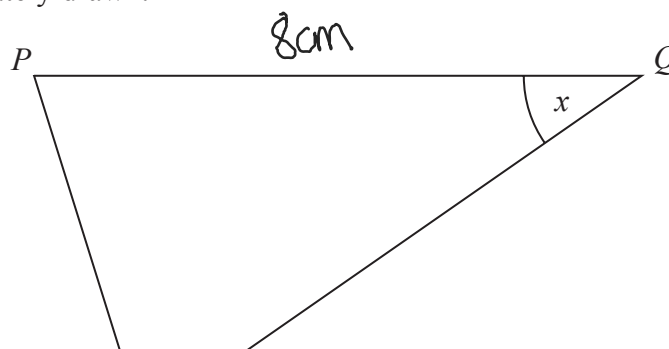
units!



1750 ml

(Total for Question 5 is 3 marks)

- 6 Here is a trapezium.
This diagram is accurately drawn.



- (a) Measure the length of the line PQ .

Use ruler

..... 8 cm
(1)

- (b) Measure the size of the angle marked x .

Use protractor

..... 35 °
(1)

(Total for Question 6 is 2 marks)

7 (a) Solve $f + 2f + f = 20$

$$4f = 20$$

$$f = \frac{20}{4} = 5$$

$$f = 5 \quad (1)$$

(b) Solve $18 - m = 6$

$$18 - m = 6$$

$$18 = 6 + m$$

$$12 = m$$

$$m = 12 \quad (1)$$

(c) Simplify $d^2 \times d^3$

$$= d^{2+3} = d^5$$

$$d^5 \quad (1)$$

(Total for Question 7 is 3 marks)

8 Jayne writes down the following

$$3.4 \times 5.3 = 180.2$$

Without doing the exact calculation, explain why Jayne's answer cannot be correct.

3.4 rounds to 3 (1sf) and 5.3 rounds to 5.

$3 \times 5 = 15$. The answer should be around 15, 180.2 is too big

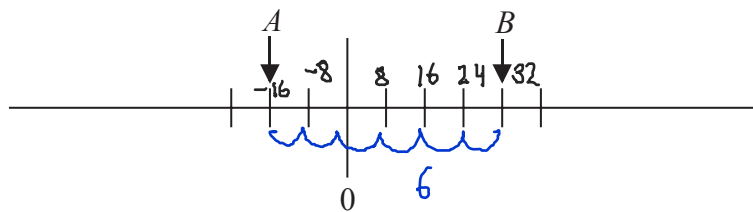
(Total for Question 8 is 1 mark)

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- 9 The two numbers, A and B , are shown on a scale.



The difference between A and B is 48

Work out the value of A and the value of B .

$$6 \text{ interval} = 48$$

$$1 \text{ interval} = 8$$

$$A = -2 \times 8 = -16$$

$$B = 4 \times 8 = 32$$

$$A = -16$$

$$B = 32$$

(Total for Question 9 is 3 marks)

- 10 Complete this table of values.

n	$3n + 2$
12	38
15	47

$$3 \times 12 + 2$$

$$= 36 + 2$$

$$3n + 2 = 47$$

$$3n = 45$$

$$n = 15$$

(Total for Question 10 is 3 marks)

11 The same number is missing from each box.

$$\square \times \square \times \square = 343$$

(a) Find the missing number.

same number $\rightarrow x^3 = 343$
 $\sqrt[3]{}$
 $x = 7$

7

(1)

(b) Work out 4^4

$$4 \times 4 \times 4 \times 4 =$$

256

(1)

(Total for Question 11 is 2 marks)

12 Here are two numbers.

29 37

Nadia says both of these numbers can be written as the **sum** of two square numbers.

Is Nadia correct?

Yes,

You must show how you get your answer.

$$29 = 25 + 4 \quad , \quad 25 = 5^2 \text{ and } 4 = 2^2$$

$$37 = 36 + 1 \quad , \quad 36 = 6^2 \text{ and } 1 = 1^2$$

Both numbers can be written as the sum of 2 squares

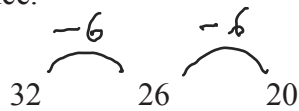
(Total for Question 12 is 3 marks)

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13 Here are the first three terms of a sequence.



Find the first two terms in the sequence that are less than zero.

$$20 - 6 = 14$$

$$14 - 6 = 8$$

$$8 - 6 = 2$$

$$2 - 6 = -4$$

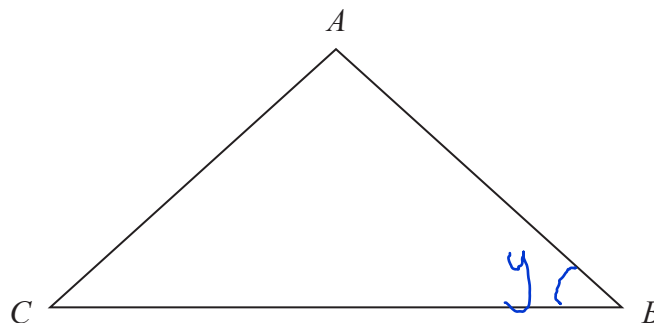
$$-4 - 6 = -10$$

} negative = less than 0

..... - 4 -10

(Total for Question 13 is 3 marks)

14 Here is a triangle ABC .

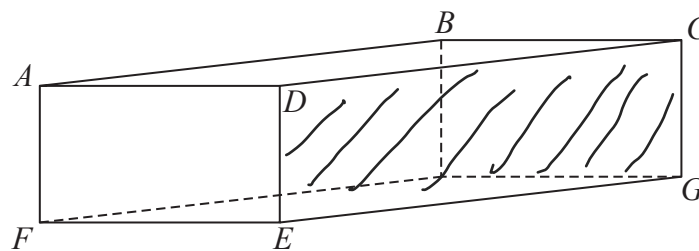


(a) Mark, with the letter y , the angle CBA .

↑
B is in the middle

(1)

Here is a cuboid.



Some of the vertices are labelled.

(b) Shade in the face $CDEG$.

(1)

(c) How many edges has a cuboid?

..... 12

(1)

(Total for Question 14 is 3 marks)

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15 There are 5 grams of fibre in every 100 grams of bread.

A loaf of bread has a weight of 400 g.
There are 10 slices of bread in a loaf.

Each slice of bread has the same weight.

Work out the weight of fibre in one slice of bread.

$$\begin{array}{l} 5\text{g fibre} : 100\text{g bread} \\ \times 4 \quad \swarrow \quad \searrow \quad \times 4 \\ 20\text{g fibre} : 400\text{g bread} \end{array}$$

$$\begin{array}{l} 20\text{g} \div 10\text{ slices} \\ = 2\text{g per slice} \end{array} \quad \dots\dots\dots 2 \text{ g}$$

(Total for Question 15 is 3 marks)

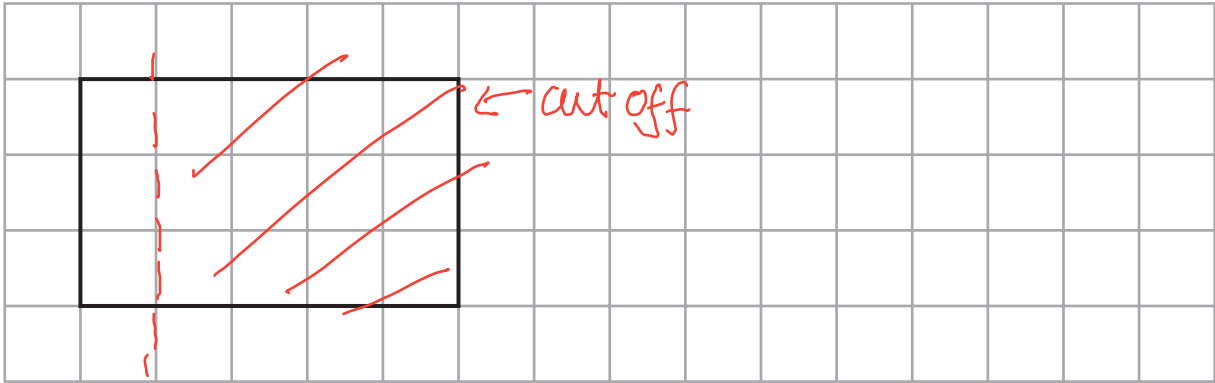
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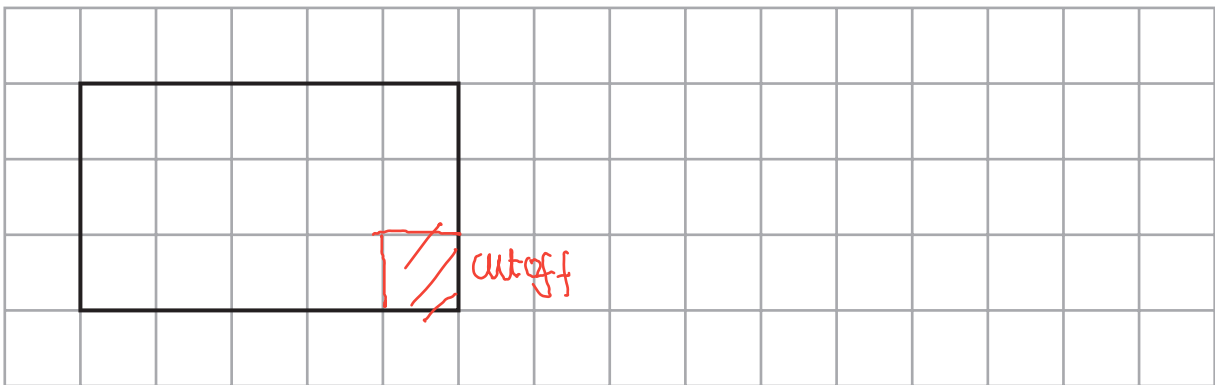
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16 Give an example to show that when a piece is cut off a rectangle the perimeter of the new shape

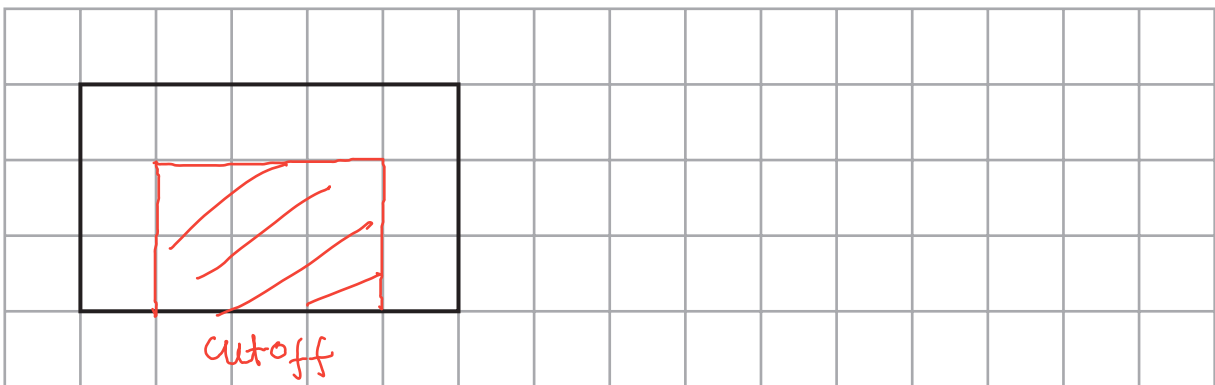
(i) is less than the perimeter of the rectangle,



(ii) is the same as the perimeter of the rectangle,



(iii) is greater than the perimeter of the rectangle.



(Total for Question 16 is 3 marks)

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17 ABC is an isosceles triangle.

When angle $A = 70^\circ$, there are 3 possible sizes of angle B .

(a) What are they?

① Angle $A =$ Angle B $70 = 70$

② Angle $A =$ Angle C Angle $B = 180 - 70 - 70 = 40$

angles add to
 180° in
triangle

③ Angle $B =$ Angle C

$$\angle B = \frac{180 - 70}{2} = 55^\circ$$

$$70 \quad , \quad 40 \quad , \quad 55 \quad .$$

(3)

When angle $A = 120^\circ$, there is only one possible size of angle B .

(b) Explain why.

A triangle can't have two obtuse angles, other the sum of angles will be more than 180° . Hence angle B is the base angle, which only has 1 value of 30° (1)

(Total for Question 17 is 4 marks)

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- 18 In a breakfast cereal, 40% of the weight is fruit.
The rest of the cereal is oats.

- (a) Write down the ratio of the weight of fruit to the weight of oats.
Give your answer in the form $1 : n$.

$$\begin{array}{c} \text{fruit} \qquad \qquad \text{oats} \\ 40\% : 60\% \end{array} \quad \swarrow 100-40$$

$$\div 40 \left(\begin{array}{c} \rightarrow \\ \leftarrow \end{array} \right) \quad 1 : 1.5 \quad \leftarrow \div 40$$

$$\frac{1}{1.5}$$

(2)

A different breakfast cereal is made using only fruit and bran.
The ratio of the weight of fruit to the weight of bran is $1 : 3$

- (b) What fraction of the weight of this cereal is bran?

$$\begin{array}{l} 1+3 = 4 \text{ parts in total} \\ 3 \text{ parts are bran} \end{array}$$

$$\frac{3}{4}$$

(1)

(Total for Question 18 is 3 marks)

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- 19 Boxes of chocolates cost £3.69 each.
A shop has an offer.

Boxes of chocolates

3 for the price of 2

Ali has £50
He is going to get as many boxes of chocolates as possible.

How many boxes of chocolates can Ali get?

$$3 \text{ boxes cost: } 3.69 \times 2 = £7.38$$

$$£50 \div £7.38 = 6.775, \text{ so can buy 6 sets of 3 boxes}$$

$$\text{This costs: } 6 \times 7.38 = 44.28$$

$$\text{He has } 50 - 44.28 = £5.72 \text{ left.}$$

So he can buy another box (£3.69)

$$6 \times 3 + 1 =$$

19 boxes

(Total for Question 19 is 3 marks)

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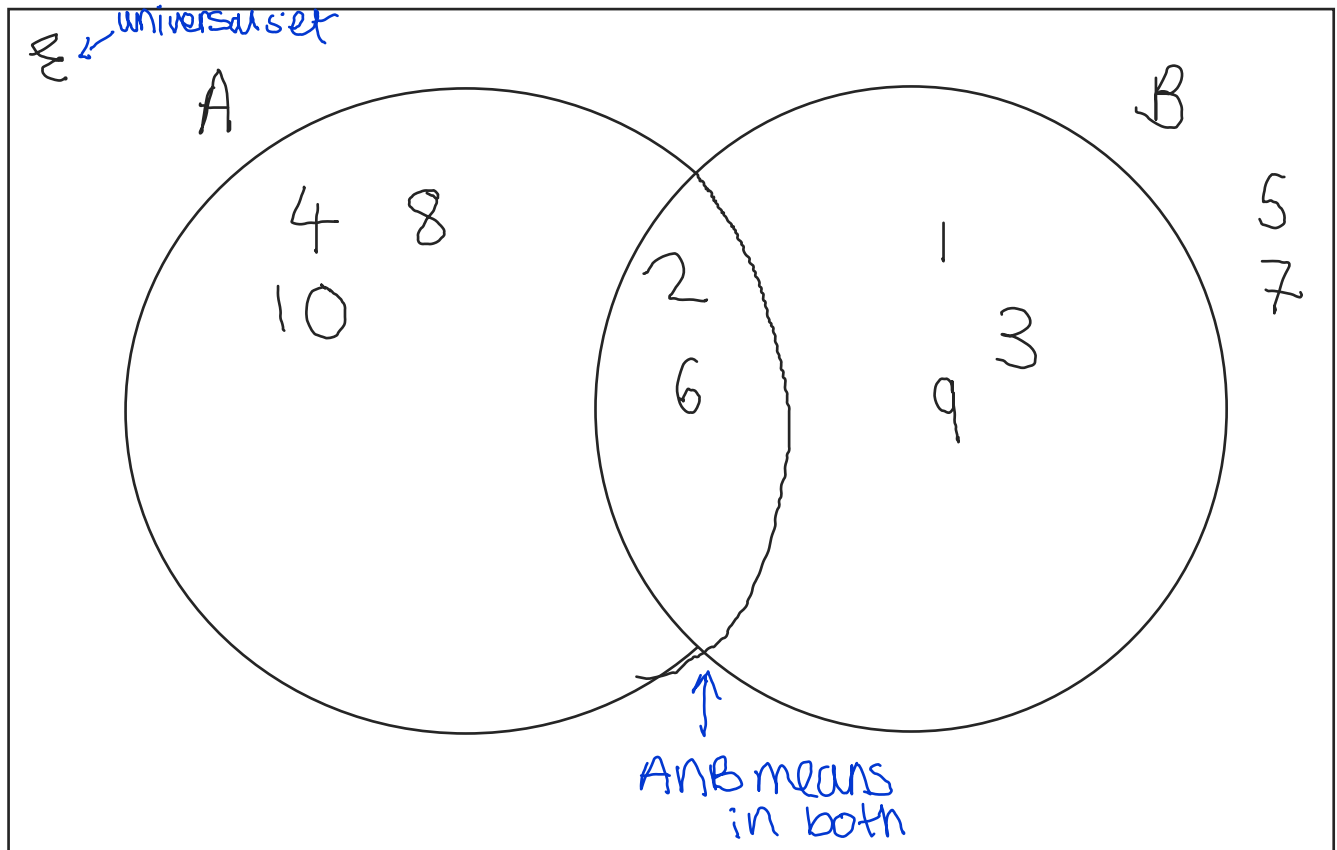
$$20 \quad \mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{\text{multiples of } 2\}$$

$$A \cap B = \{2, 6\}$$

$$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\} \quad \leftarrow \text{in } A \text{ or } B$$

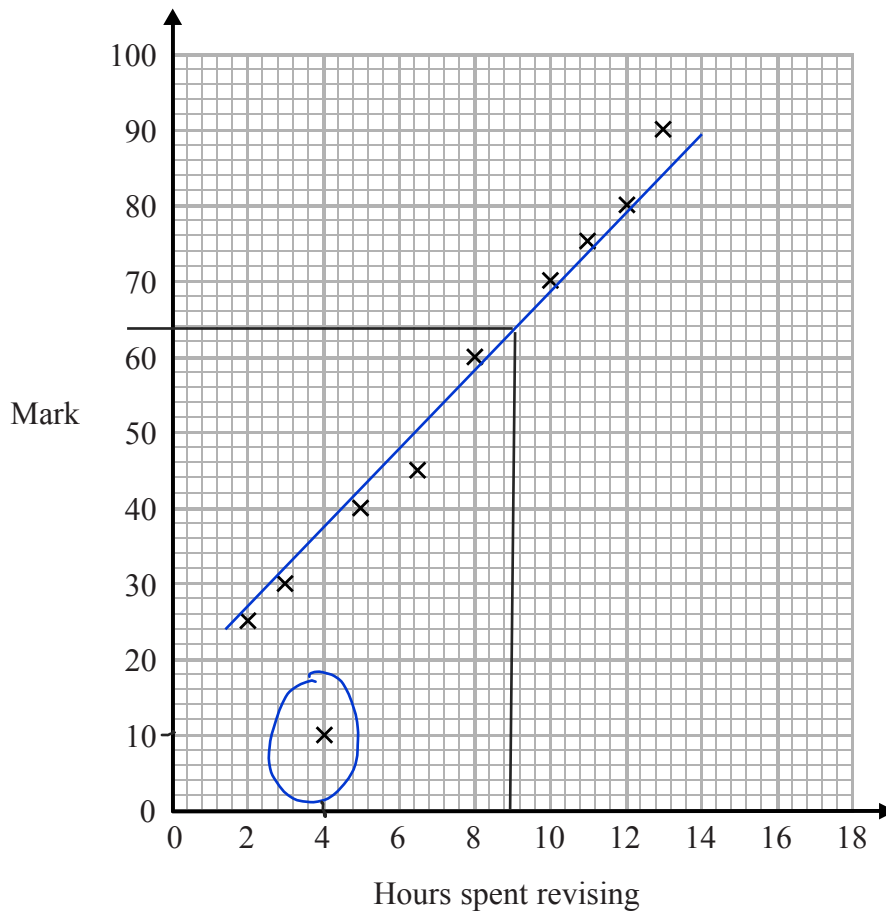
Draw a Venn diagram for this information.



(Total for Question 20 is 4 marks)

21 The scatter diagram shows information about 10 students.

For each student, it shows the number of hours spent revising and the mark the student achieved in a Spanish test.



One of the points is an outlier.

(a) Write down the coordinates of the outlier.

(4, 10)
(1)

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For all the **other** points

- (b) (i) draw the line of best fit,
 (ii) describe the correlation.

Positive correlation

(2)

A different student revised for 9 hours.

- (c) Estimate the mark this student got

64

(1)

The Spanish test was marked out of 100

Lucia says,

“I can see from the graph that had I revised for 18 hours I would have got full marks.”

- (d) Comment on what Lucia says.

Lucia can't be sure, 18 hours is outside the range of data so this is unreliable

(1)

(Total for Question 21 is 5 marks)

- 22 The length, L cm, of a line is measured as 13 cm correct to the nearest centimetre.

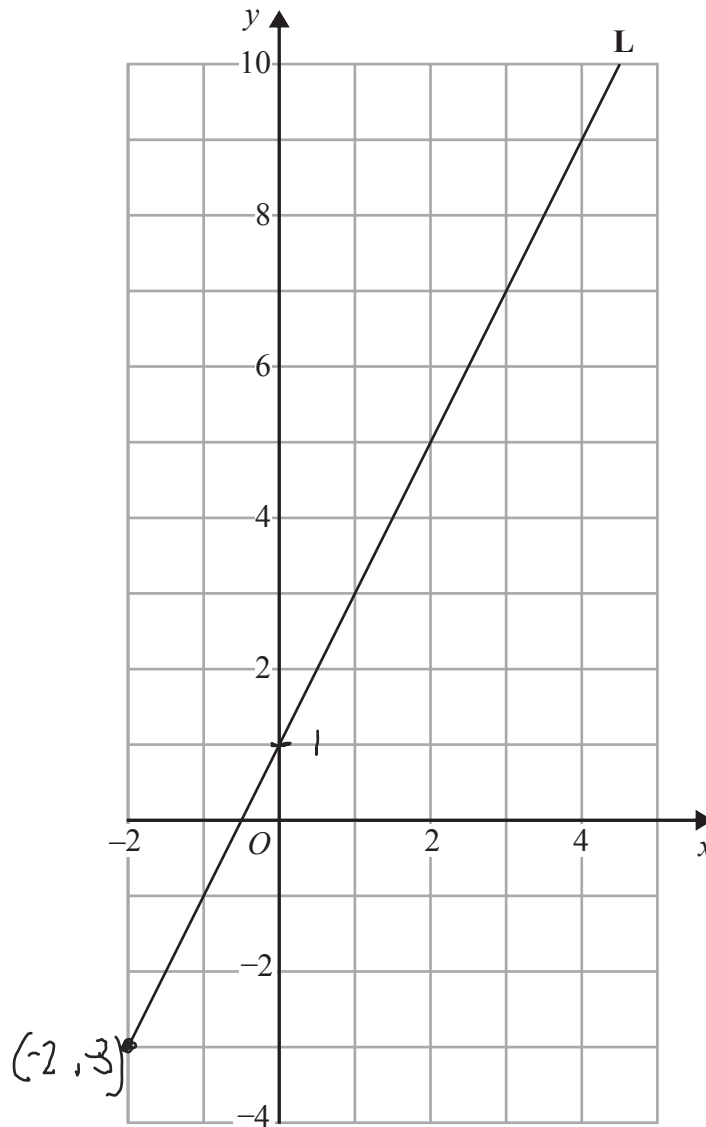
Complete the following statement to show the range of possible values of L

value in this range round to B

$$12.5 \leq L < 13.5$$

(Total for Question 22 is 2 marks)

23 Line L is drawn on the grid below.



Find an equation for the straight line L.
Give your answer in the form $y = mx + c$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{1 - 3}{0 - (-2)} = \frac{-2}{2} = m = -1$$

$$y = 2x + 1$$

(Total for Question 23 is 3 marks)

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24 Jenny works in a shop that sells belts.

The table shows information about the waist sizes of 50 customers who bought belts from the shop in May.

Belt size	Waist (w inches)	Midpoint	Frequency	$f \times \text{Midpoint}$
Small	$28 < w \leq 32$	30	24	720
Medium	$32 < w \leq 36$	34	12	408
Large	$36 < w \leq 40$	38	8	304
Extra Large	$40 < w \leq 44$	42	6	252
			50	

(a) Calculate an estimate for the mean waist size.

$$\text{Mean} = \frac{\sum \text{midpoint} \times \text{freq}}{\sum \text{freq}} = \frac{720 + 408 + 304 + 252}{50}$$

$$= \frac{1684}{50} = 33.68 \text{ in}$$

33.68 inches
(3)

Belts are made in sizes Small, Medium, Large and Extra Large.

Jenny needs to order more belts in June.

The modal size of belts sold is Small.

Jenny is going to order $\frac{3}{4}$ of the belts in size Small.

The manager of the shop tells Jenny she should **not** order so many Small belts.

(b) Who is correct, Jenny or the manager?

You must give a reason for your answer.

$$\frac{3}{4} = 0.75$$

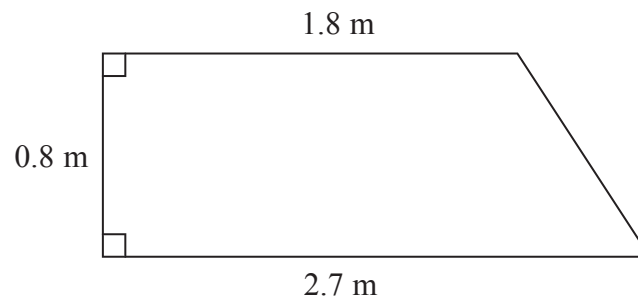
$$\text{Fraction of Small belts} = \frac{24}{50} = 0.48$$

The manager is correct, $0.48 < 0.75$. Jenny would be ordering too many belts

(2)

(Total for Question 24 is 5 marks)

25 The diagram shows part of a wall in the shape of a trapezium.



Karen is going to cover this part of the wall with tiles.

Each rectangular tile is 15 cm by 7.5 cm

Tiles are sold in packs. 0.15 m 0.075 m

There are 9 tiles in each pack.

Karen divides the area of the wall by the area of a tile to work out an estimate for the number of tiles she needs to buy.

(a) Use Karen's method to work out an estimate for the number of packs of tiles she needs to buy.

$$\text{Area of wall} = \frac{1}{2}(1.8 + 2.7) \times 0.8 = 1.8\text{ m}^2$$

$$\text{Area of 1 tile} = 0.15 \times 0.075 = 0.01125\text{ m}^2$$

$$\text{Tiles needed} : \frac{1.8\text{ m}^2}{0.01125} = 160 \text{ tiles}$$

$$\frac{160}{9} = 17.\dot{7} \text{ - number of packs needed}$$

|
round up

18

(5)

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Karen is advised to buy 10% more tiles than she estimated.
Buying 10% more tiles will affect the number of the tiles Karen needs to buy.

She assumes she will need to buy 10% more packs of tiles.

- (b) Is Karen's assumption correct?
You must show your working.

$$10\% \text{ increase} = 100\% + 10\% = 110\% = \times 1.1 \text{ multiplier}$$

$$1.1 \times 160 = 176 \text{ tiles needed} \quad \frac{176}{9} = 19.5 \approx 20 \text{ packs needed}$$

$$1.1 \times 18 = 19.8 \text{ packs}$$

$$19.8 \neq 20 \quad \text{Karen is incorrect} \quad (2)$$

(Total for Question 25 is 7 marks)

- 26 Factorise $x^2 + 3x - 4$

$$\begin{array}{l} \text{multiply to } -4 \\ \text{add to } 3 \end{array} \quad \left. \begin{array}{l} \\ \end{array} \right\} +4, -1$$

$$(x+4)(x-1)$$

(Total for Question 26 is 2 marks)

27 Here are the equations of four straight lines.

Line A	$y = 2x + 4$	$m = 2$		
Line B	$2y = x + 4$	$y = \frac{x}{2} + 2$	$m = \frac{2x}{2}$	
Line C	$2x + 2y = 4$	$y = 2 - x$	$m = -1$	
Line D	$2x - y = 4$	$2x + 4 = y$	$m = 2$	

Two of these lines are parallel.
Write down the two parallel lines.

$$y = mx + c$$

parallel means m is the same

Line A and line D

(Total for Question 27 is 1 mark)

28 The densities of two different liquids A and B are in the ratio 19 : 22

The mass of 1 cm³ of liquid B is 1.1 g.

$$\text{Density} = \frac{\text{mass}}{\text{vol}}$$

5 cm³ of liquid A is mixed with 15 cm³ of liquid B to make 20 cm³ of liquid C.

Work out the density of liquid C.

B : Density = $\frac{1.1}{1} = 1.1 \text{ g/cm}^3$

Mass = $1.1 \times 15 = 16.5 \text{ g}$

A : Density = $\frac{19}{22} \times 1.1 = 0.95 \text{ g/cm}^3$ (ratio)

Mass of A = $0.95 \times 5 = 4.75 \text{ g}$

Density of C: $\frac{16.5 + 4.75}{15 + 5} = 1.0625 \text{ g/cm}^3$ (Total mass / Total vol)

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

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