

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

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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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.CG Maths.
Worked Solutions



Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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.

0.320 0.400 0.350 0.309

Writing all the decimals to 3 decimal places by putting 0s at the end makes them easier to order

0.309, 0.32, 0.35, 0.4

(Total for Question 1 is 1 mark)

- 2 Here is a list of numbers.

5 11 18 22 29

From the list, write down a multiple of 3

$3 \times 6 = 18$, so 18 must be a multiple of 3

18

(Total for Question 2 is 1 mark)

- 3 Write 4.666 correct to the nearest whole number.

The 4 is in the units place. The 6 in the next place causes it to round up to a 5 then all digits after it are ignored

5

(Total for Question 3 is 1 mark)

- 4 Write $\frac{3}{4}$ as a decimal.

$4 \overline{) 3.00}$ 0.75

Dividing 3 by 4 converts $\frac{3}{4}$ to a decimal

0.75

(Total for Question 4 is 1 mark)

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

The 7 is in the hundreds place

700

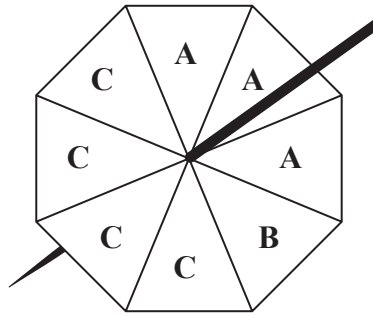
(Total for Question 5 is 1 mark)

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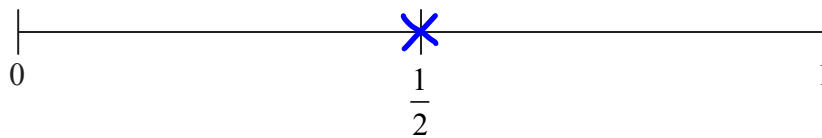
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6 Gita spins a fair 8-sided spinner.

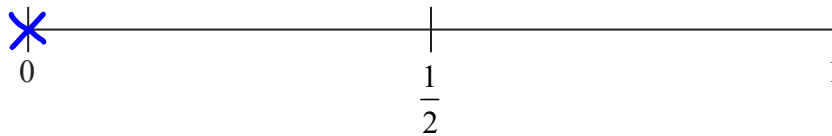


- (a) On the probability scale, mark with a cross (×) the probability that the spinner will land on C.



4 out of the 8 sections are C. $4/8$ simplifies to $1/2$ (1)

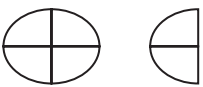
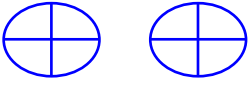
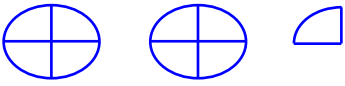
- (b) On the probability scale, mark with a cross (×) the probability that the spinner will land on D.



0 out of the 8 sections are D. $0/8$ simplifies to 0. Getting a D is impossible (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:

$$\bigoplus = 12$$

On Monday the shop sold 18 eggs.

On Tuesday the shop sold 24 eggs.

On Wednesday the shop sold 27 eggs.

Use this information to complete the pictogram and the key.

$$18 \div 6 = 3$$

There are 6 quarters of the symbol for Monday and these represent 18. Dividing the 18 by the 6 quarters works out that each quarter of a symbol must represent 3. There are 4 quarters in a whole symbol so each symbol must represent 12 as $3 \times 4 = 12$

$$24 \div 3 = 8$$

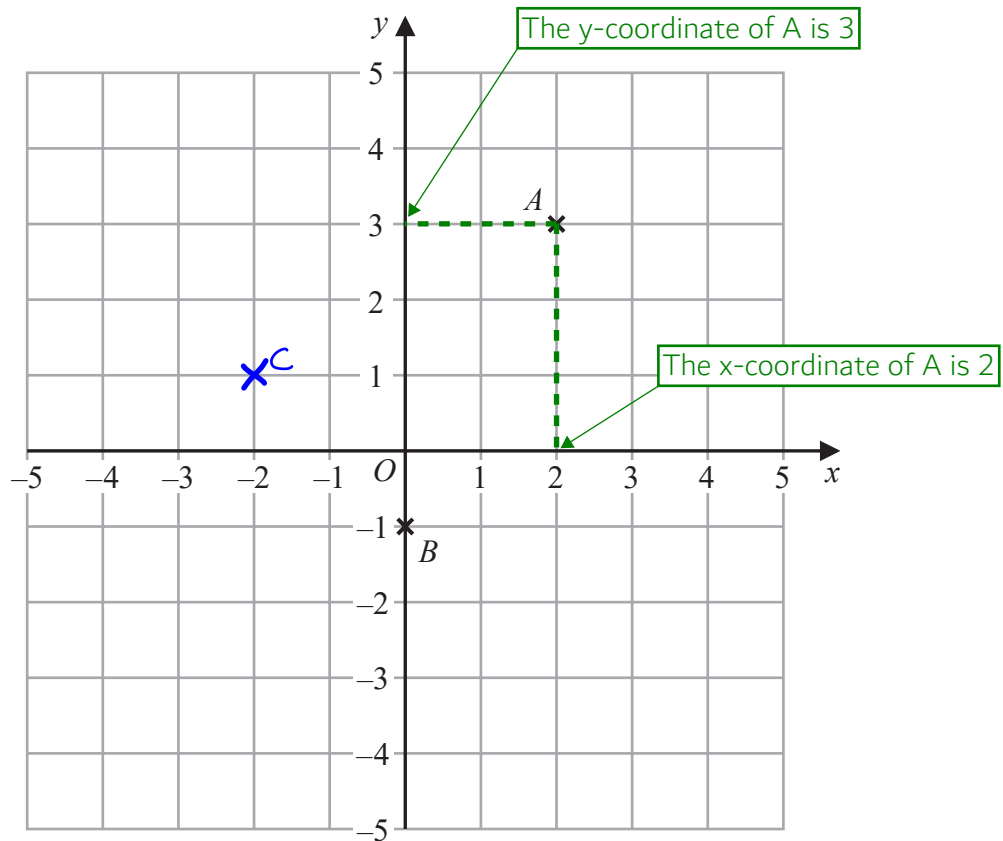
So there must be 8 quarters for Tuesday

$$27 \div 3 = 9$$

So there must be 9 quarters for Wednesday

(Total for Question 7 is 4 marks)

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.

3 + 4 = 7 parts in total in the ratio. Out of these, 3 are red

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

(1)

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

To get 1 part on the left side, both sides need to be divided by 12. As 30 cannot be divided by 12 to get a whole number, 30/12 can be left as an unsimplified fraction

$$1 : \frac{30}{12}$$

(2)

(Total for Question 9 is 3 marks)

- 10 Jenny has 12 marbles.

$\frac{1}{4}$ of these 12 marbles are large.

The rest of these 12 marbles are small.

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.

$$12 \div 4 = 3$$

This works out that $\frac{1}{4}$ of the 12 marbles is 3 marbles. So there are 3 large marbles

$$12 - 3 = 9$$

Subtracting the 3 large marbles from the 12 marbles finds that there are 9 small marbles

$$3 \times 70 = 210$$

Multiplying the 3 large marbles by the 70 gram weight of each works out that the large marbles weigh 210 grams in total. $3 \times 7 = 21$ so $3 \times 70 = 210$

$$9 \times 50 = 450$$

Multiplying the 9 small marbles by the 50 gram weight of each works out that the small marbles weigh 450 grams in total. $9 \times 5 = 45$ so $9 \times 50 = 450$

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

Adding the 210 grams for the large marbles and the 450 grams for the small marbles finds that the total weight of the 12 marbles is 660 grams

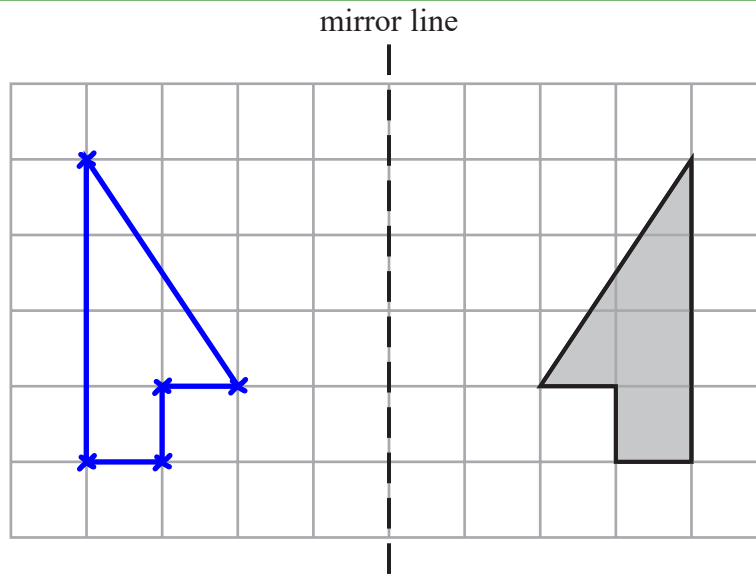
660

grams

(Total for Question 10 is 4 marks)

11

Reflecting each corner by counting the number of jumps to the mirror line then doing the same number of jumps on the other side then joining them up with a ruler



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

$$7 \times 2 \leftarrow \text{Multiplying the input of 7 by 2 gives 14}$$

$$14 - 3 \leftarrow \text{Then subtracting 3 from the 14 gives 11}$$

11

(1)

(b) Find the input when the output is 41

$$41 + 3 \leftarrow \text{Going backward in the number machine from the output to the input. The opposite of subtracting 3 is adding 3 to get 44}$$

$$2 \overline{) 44} \leftarrow \text{Then the opposite of multiplying by 2 is dividing by 2}$$

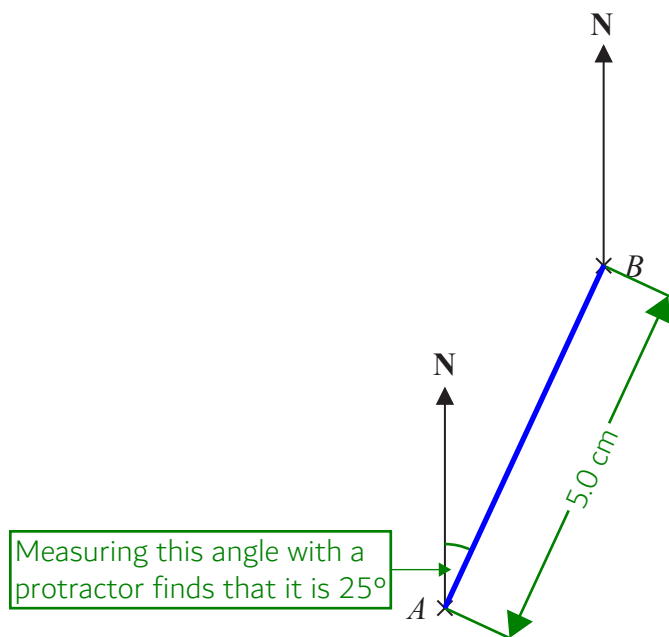
22

(2)

(Total for Question 12 is 3 marks)

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

Diagram accurately drawn



Scale: 1 to 25 000

(a) Find the bearing of B from A .

The bearing is the number of degrees turned clockwise from North at A to face B . The answer should be given with 3 figures so a 0 is put at the start

..... 025
(1)

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

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

The scale is 1 to 25000 so the 5 cm measured on the diagram is actually 25000 times greater. So the actual distance is 125000 cm

There are 100 cm in 1 m so dividing by 100 converts into metres. This moves the decimal point twice to the left. There are 1000 m in 1 km so dividing by 1000 converts into kilometres. This moves the decimal point three times to the left

..... 1.25 kilometres
(3)

(Total for Question 13 is 4 marks)

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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.

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

(Total for Question 14 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.

$$750 \times 10$$

1 part is 750 ml. There are $1 + 9 = 10$ parts in total so multiplying the 750 ml by 10 works out there is 7500 ml of drink

$$7500 \div 1000$$

There are 1000 ml in 1 L so this works out the amount of drink in litres

There are 7.5 L of the drink. The 0.5 L is not enough to completely fill a bottle so this is ignored

7

(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 scores go up to 4

5 is higher than 4 so it is not possible for this to be the median, which is the middle score when they are put in order

(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.

$$0 \times 1 = 0$$

0×1 is not equal to 1

(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 $\frac{1}{10}$ 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.

$500 \div 10$ ← Dividing the £500 normal price by 10 works out that $\frac{1}{10}$ of the normal price is £50

$500 - 50$ ← Reducing the £500 normal price by £50 gives £450 as the sale price on Monday

$450 \div 10$ ← Dividing the £450 sale price by 10 works out that 10% of the sale price is £45

$$\begin{array}{r} 45 \\ \times 2 \\ \hline 90 \\ 1 \end{array}$$
 ← Multiplying the value of 10% of the sale price by 2 works out that 20% of the sale price is £90

$$\begin{array}{r} 450 \\ - 90 \\ \hline 360 \end{array}$$
 ← Reducing the £450 sale price by the value of 20% works out that the price is reduced to £360 on Tuesday

Yes ← £400 is more than the £360 so Chris has enough money

(Total for Question 17 is 5 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.

The sequence increases by 3 each term so it must involve $3n$. The 0th term (the one before the first term) would be -2 so it must be $3n - 2$

$$3n - 2$$

(Total for Question 20 is 2 marks)

21 Show that

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

$$\frac{7}{3} \times \frac{15}{4}$$

Converting the mixed numbers on the left into improper fractions by multiplying the whole number by the denominator then adding the result to the numerator. $2 \times 3 = 6$. $1 + 6 = 7$. $3 \times 4 = 12$. $3 + 12 = 15$.

$$\frac{7}{1} \times \frac{5}{4}$$

Dividing both the 3 on the denominator and the 15 on the numerator by 3 to simplify the multiplication

$$\frac{35}{4}$$

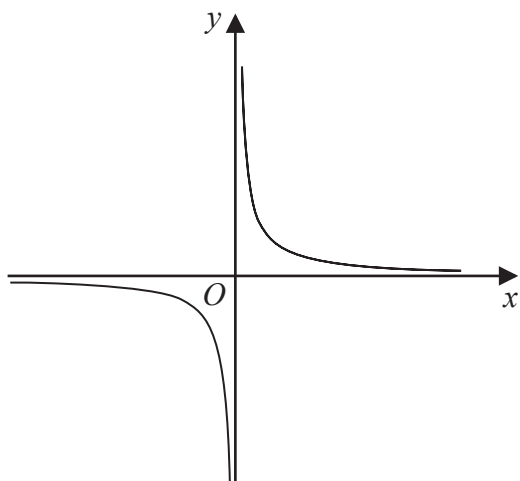
Multiplying the fractions by multiplying the numerators and multiplying the denominators

$$8\frac{3}{4}$$

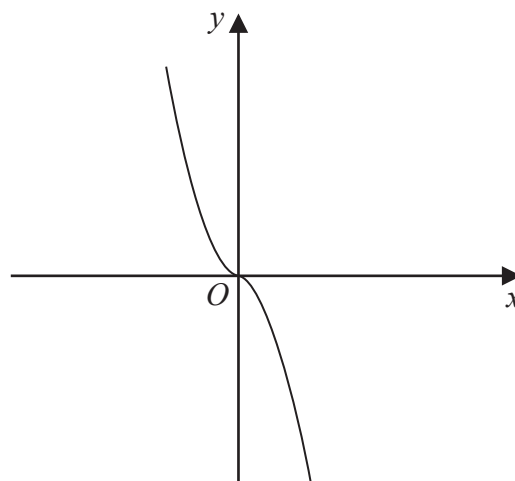
Converting to a mixed number by dividing the numerator by the denominator to get the whole number and leaving the remainder in the fraction

(Total for Question 21 is 3 marks)

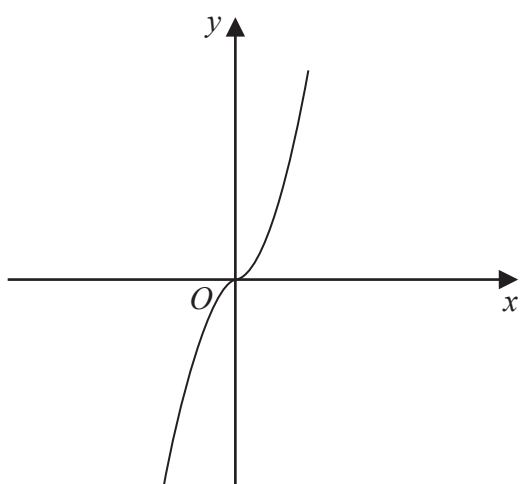
22 The diagram shows four graphs.



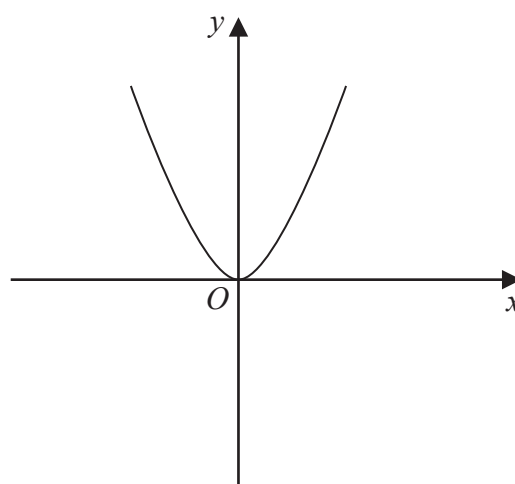
Graph A



Graph B



Graph C



Graph D

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

Complete the table.

Doing a table of values for x values from -1 to 1 for each equation can work out which graph is which equation

x	-1	0	1	Equation	Letter of graph	
y	1	0	-1	$y = -x^3$	B	← Is decreasing so must be B
y	-1	0	1	$y = x^3$	C	← Is increasing so must be C
y	1	0	1	$y = x^2$	D	← Decreases then increases so must be D
y	-1	-	1	$y = \frac{1}{x}$	A	← No value when $x = 0$ so must be A

Cannot divide by 0

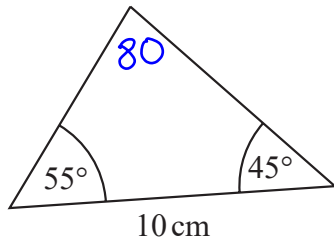
(Total for Question 22 is 2 marks)

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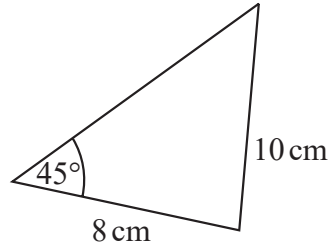
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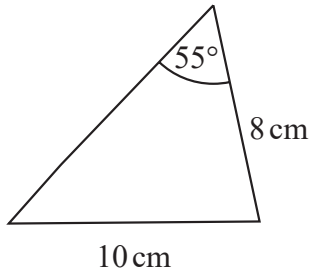
23 The diagram shows four triangles.



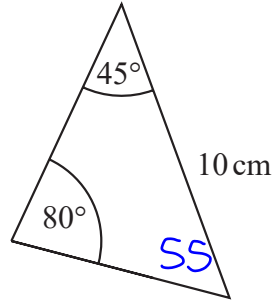
Triangle A



Triangle B



Triangle C



Triangle D

Two of these triangles are congruent. ← Same shape and size

Write down the letters of these two triangles.

It can't be B or C as the 10 cm is opposite a different angle to the others

..... 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.

$24 \div 2$ ← 50p is half of £1. So halving the 24 bars works out that the income from selling them is £12

$12 - 10$ ← Subtracting the original £10 paid from the £12 income works out that the profit is £2

$\frac{2}{10}$ ← Putting the £2 profit over the £10 paid expresses the profit as a fraction

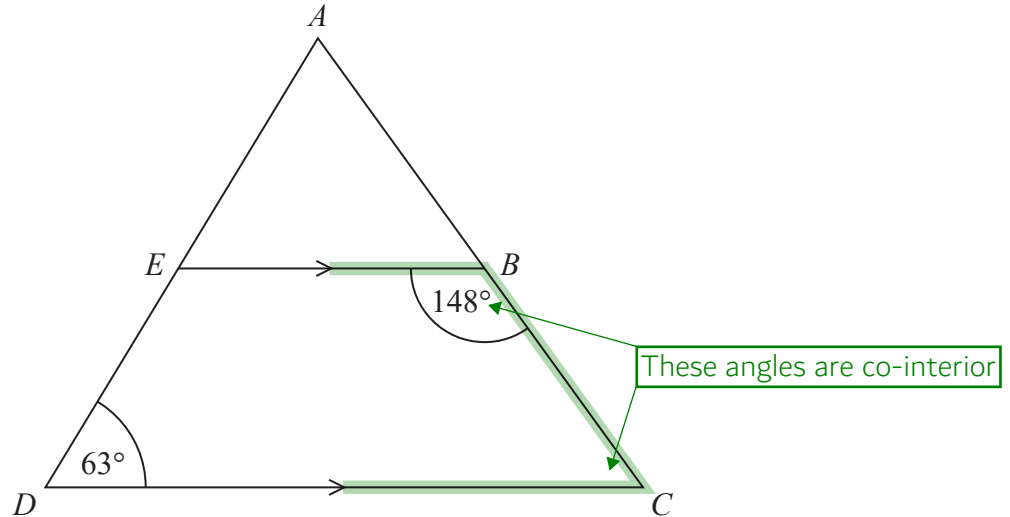
$\frac{20}{100}$ ← Multiplying both the numerator and denominator by 10 gets 100 as the denominator

Percentage is out of 100 so $20/100$ is 20%

..... 20 %

(Total for Question 24 is 3 marks)

25 ADC is a triangle.



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.

Angle $BCD = 180^\circ - 148^\circ = 32^\circ$ as co-interior angles add up to 180°

Subtracting angle EBC from 180° leaves angle BCD

Angle $EAB = 180^\circ - 63^\circ - 32^\circ = 85^\circ$ as angles in a triangle add up to 180°

Subtracting angle ADC and angle BCD from the 180° in triangle ADC leaves angle EAB

(Total for Question 25 is 5 marks)

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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

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

Key: 15 8 represents 158 cm

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

The 168 median for boys is higher than the 165 median for girls

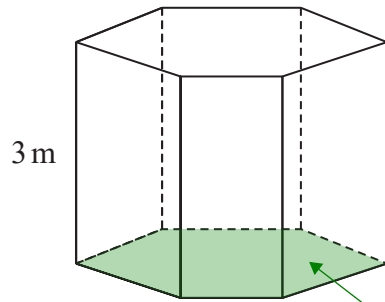
$(15 + 1)/2 = 8$ so the 8th value is the median for the boys. They are arranged in order in the stem and leaf diagram so counting to the 8th value from the top left finds the median

The 24 range for boys is higher than the 20 range for girls

The greatest value for the boys was 182 and the least was 158. Range for the boys = $182 - 158 = 24$. Range for the girls = $170 - 150 = 20$

(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

This is the cross sectional area,
the area in contact with the floor

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.

$$18 \div 3 \leftarrow \begin{array}{l} \text{Volume of prism} = \text{cross sectional area} \times \text{length.} \\ \text{Cross sectional area} = \text{volume of prism} \div \text{length.} \\ \text{So the cross sectional area in contact with the floor is } 6 \text{ m}^2 \end{array}$$

$$75 = \frac{F}{6} \leftarrow \text{Substituting the } 75 \text{ newtons/m}^2 \text{ pressure and the } 6 \text{ m}^2 \text{ area into the formula. Let } F \text{ be the force}$$

$$\begin{array}{r} 75 \\ \times 6 \\ \hline 450 \\ \end{array} \leftarrow \text{Multiplying both sides by 6 gets the force on its own}$$

.....450..... newtons

(Total for Question 27 is 3 marks)

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

$$6.72 \times 10^5 \quad 67.2 \times 10^{-4} \quad 672 \times 10^4 \quad 0.000672$$

$$672000 \quad 0.00672 \quad 6720000$$

Writing the numbers as ordinary numbers. $\times 10^n$ means to multiply by 10 n times. $\times 10^{-n}$ means to divide by 10 n times

$$\underline{\hspace{1cm} 0.000672 \hspace{1cm} 67.2 \times 10^{-4} \hspace{1cm} 6.72 \times 10^5 \hspace{1cm} 672 \times 10^4 \hspace{1cm} \underline{\hspace{1cm}}}$$

(Total for Question 28 is 2 marks)

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

find $a:b:c$

$$\begin{array}{c|c|c} a & b & c \\ \hline 2 & 5 & \\ \hline & 3 & 4 \end{array}$$

a could be 2 while b could be 5. b could be 3 while c could be 4. Writing these as ratios in columns

b is in common to both ratios and a common multiple of 5 and 3 is 15. Multiplying both sides of the first ratio by 3 and both sides of the second ratio by 5 makes it so that the ratios can be combined

$$6:15:20$$

(Total for Question 29 is 3 marks)

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

$$6q = p - 7 \quad \leftarrow \text{Subtracting 7 from both sides gets the } q \text{ term on its own}$$

$$\text{Dividing both sides by 6 gets } q \text{ on its own} \rightarrow q = \frac{p-7}{6}$$

(2)

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

$$(a^x)^y = a^{xy}. \text{ So multiplying the indices. } -2 \times -3 = 6$$

$$m^6$$

(1)

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS