

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 indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

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

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

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

0.32      0.4      0.35      0.309

They all have 0 units. 0.4 must be the largest as it has 4 tenths and the others only have 3. Then comparing the hundredths: 0.309 has 0 so is smallest, 0.32 has 2 so is next then 0.35 has 5 so is next

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 and all the other digits after it are ignored

5

(Total for Question 3 is 1 mark)

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

$$4 \overline{) 3.00} \begin{array}{r} 0.75 \\ \underline{4 \phantom{0} 0} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

$\frac{3}{4}$  is quite a common fraction so is one which we might know as a decimal. But if we don't, dividing 3 by 4 converts  $\frac{3}{4}$  into 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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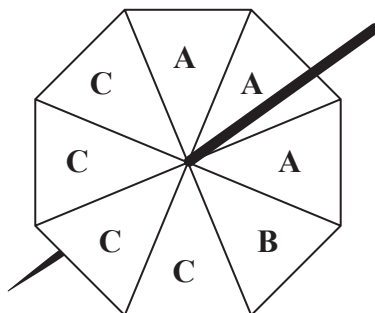
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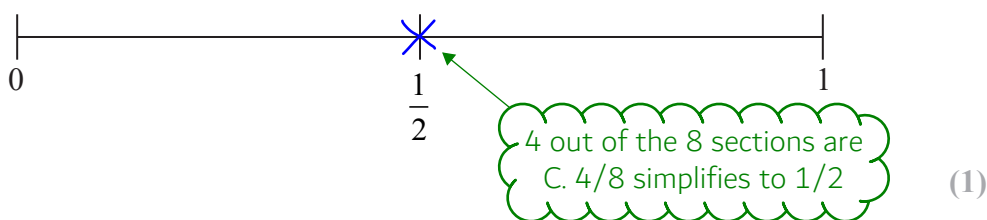
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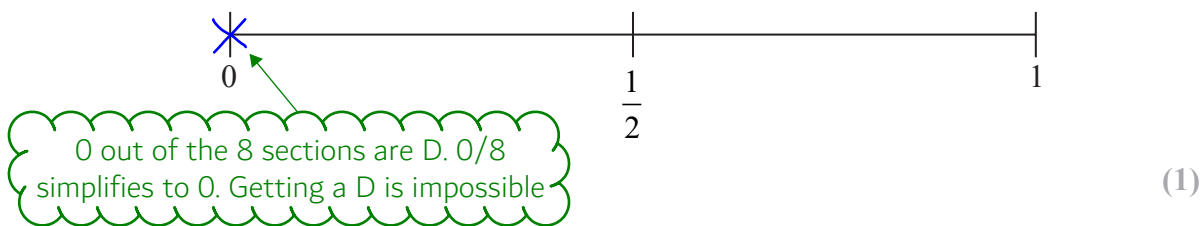
6 Gita spins a fair 8-sided spinner.



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

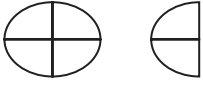
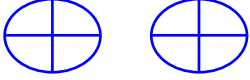
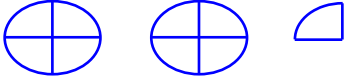


(b) On the probability scale, mark with a cross (×) the probability that the spinner will land on D.

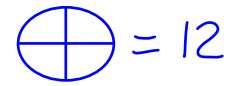


(Total for Question 6 is 2 marks)

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

Monday	
Tuesday	
Wednesday	

Key:



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. So each quarter of a symbol must represent 3. There are 4 quarters in a whole symbol so each symbol must represent 12 as  $3 \times 4 = 12$

$$24 \div 3 = 8$$

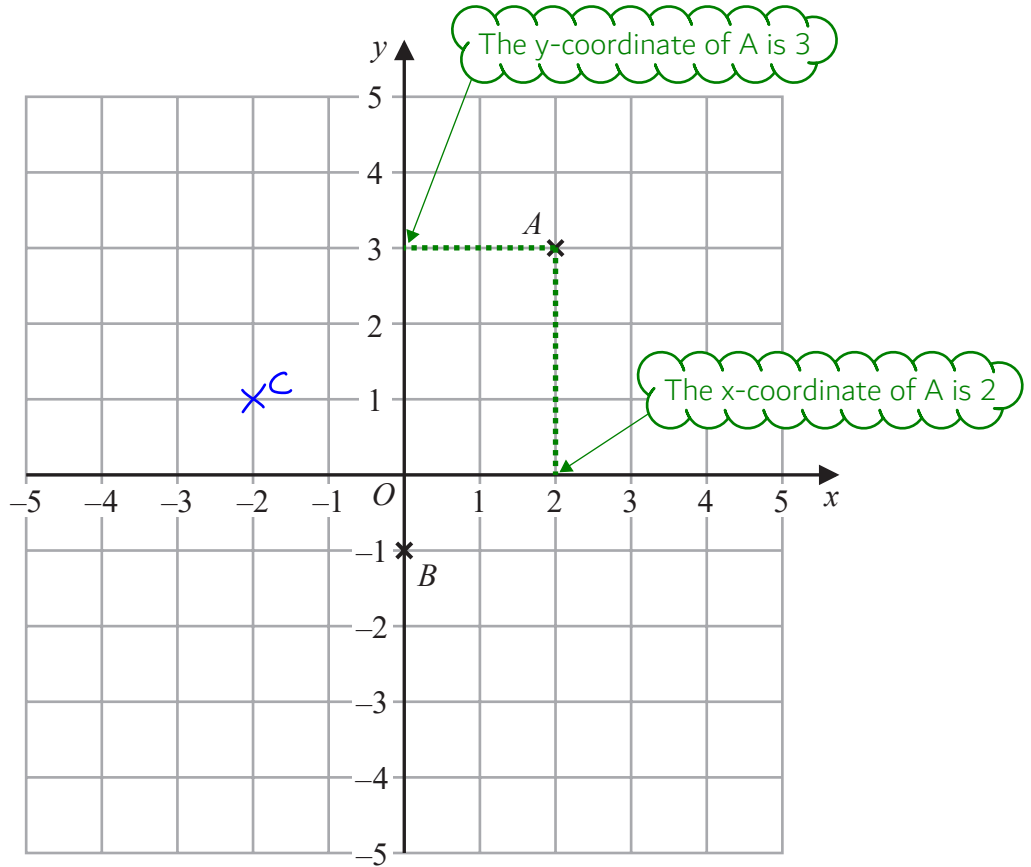
So there must be 8 quarters for Tuesday.  $8/4 = 2$  whole symbols

$$27 \div 3 = 9$$

So there must be 9 quarters for Wednesday.  $9/4 = 2\frac{1}{4}$  whole symbols

(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)

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- 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.

There are 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.

$$\frac{1}{4} \times 12 = 3$$

$\frac{1}{4}$  of 12 =  $\frac{1}{4} \times 12 = \frac{12}{4} = 3$ . So there are 3 large marbles

$$12 - 3 = 9$$

Subtracting the 3 large marbles from the 12 total marbles works out that there are 9 small marbles

$$3 \times 70 = 210$$

Working out the weight of the 3 large marbles.  $3 \times 7 = 21$  so  $3 \times 70 = 210$

$$9 \times 50 = 450$$

Working out the weight of the 9 small marbles.  $9 \times 5 = 45$  so  $9 \times 50 = 450$

$$660$$

Adding 210 and 450 to get the total weight using column addition

$$660$$

grams

(Total for Question 10 is 4 marks)

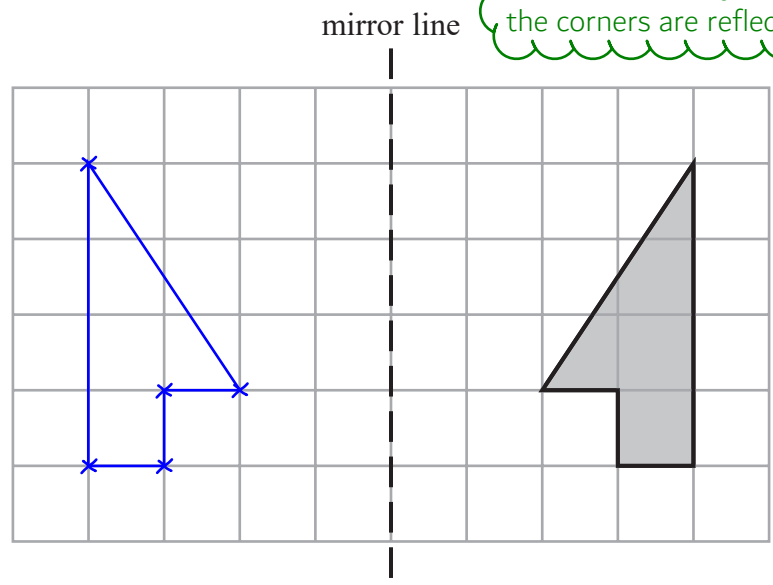
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11

Reflect each corner one at a time by counting the number of jumps to the mirror line then doing the same number of jumps on the other side. Once all the corners are reflected, join 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

$7 \times 2 = 14$   
 $14 - 3 = 11$

11  
 -----  
 (1)

(b) Find the input when the output is 41

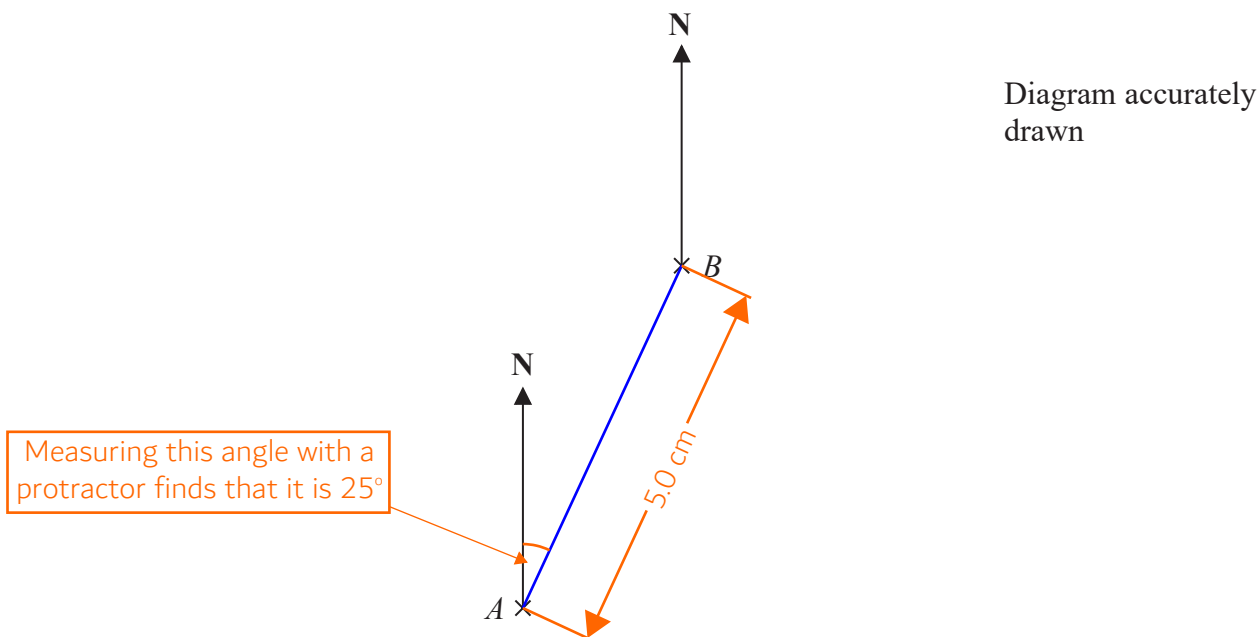
Starting with the output and working backward to the input. The reverse operations need to be done.  
 $41 + 3 = 44$   
 $44 / 2 = 22$

22  
 -----  
 (2)

(Total for Question 12 is 3 marks)



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



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

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 5cm measured on the diagram is actually 25000 times greater. This works out the actual distance is 125000cm

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

$$750 \times 10 = 7500$$

1 part is 750ml. There are 10 parts in total so this works out the amount of drink in millilitres

$$7500 \div 1000$$

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

There are 7.5L of the drink. The 0.5L isn't 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.

$$0 \times 1 = 0$$

(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.

$$500 \div 10 = 50$$

This works out  $\frac{1}{10}$  of the normal price

$$500 - 50 = 450$$

This works out the sale price on Monday

$$10\% = 45$$

Dividing the sale price on Monday by 10 works out 10%

$$20\% = 90$$

Multiplying 10% by 2 works out 20% of the sale price on Monday

$$\begin{array}{r}
 450 \\
 - 90 \\
 \hline
 360
 \end{array}$$

This works out the sale price on Tuesday

Yes

The sale price on Tuesday is less than the £400 he has

(Total for Question 17 is 5 marks)

18 Work out an estimate for  $\frac{790 \times 289}{49}$

$$\frac{800 \times 300}{50}$$

Rounding each number to 1 significant figure

$$\frac{240000}{50}$$

$$\begin{aligned} 8 \times 3 &= 24 \\ 800 \times 3 &= 2400 \\ 800 \times 300 &= 240000 \end{aligned}$$

Divide both the numerator and denominator by 10 to simplify the fraction

$$5 \overline{) 240000} \begin{array}{r} 04800 \\ \underline{20000} \\ 40000 \\ \underline{35000} \\ 50000 \\ \underline{45000} \\ 50000 \\ \underline{45000} \\ 50000 \\ \underline{45000} \\ 50000 \end{array}$$

4800

(Total for Question 18 is 3 marks)

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

$$x^2 - 4x$$

(1)

(b) Factorise  $15y - 10$

5 is the highest common factor of  $15y$  and  $-10$ . Bringing this out as a factor and leaving the rest in a bracket

$$5(3y-2)$$

(1)

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

$$f-5 = 4$$

Dividing both sides by 7

Adding 5 to both sides

$$f = 9$$

(2)

(Total for Question 19 is 4 marks)

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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

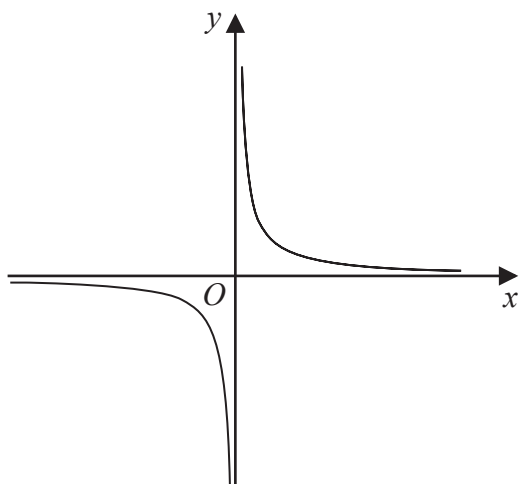
$$2\frac{1}{3} \times 3\frac{3}{4} = 8\frac{3}{4}$$

$$\frac{7}{3} \times \frac{15}{4} = \frac{35}{4} = 8\frac{3}{4}$$

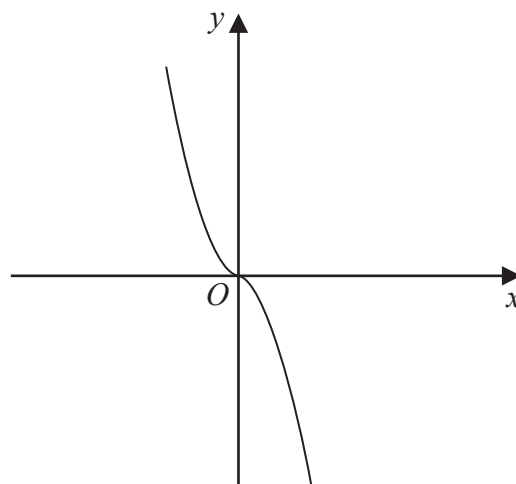
Converting the mixed numbers into improper fractions by multiplying the whole number by the denominator then adding the result to the numerator.  $2 \times 3 = 6$ .  $1 + 6 = 7$ .  $3 \times 4 = 12$ .  $3 + 12 = 15$ .  
Cancelling out a factor of 3 from the numerators and denominators makes the multiplication of the fractions easier.  $3/3 = 1$  and  $15/3 = 5$  so it becomes  $7/1 \times 5/4$ . The fractions can be multiplied by multiplying the numerators and denominators.  $7 \times 5 = 35$ .  $1 \times 4 = 4$ .  
8 lots of 4 go into 35 with a remainder of 3 so it becomes  $8\frac{3}{4}$  as a mixed number

(Total for Question 21 is 3 marks)

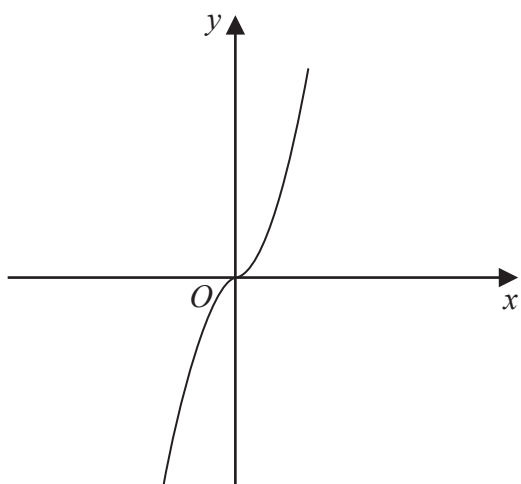
22 The diagram shows four graphs.



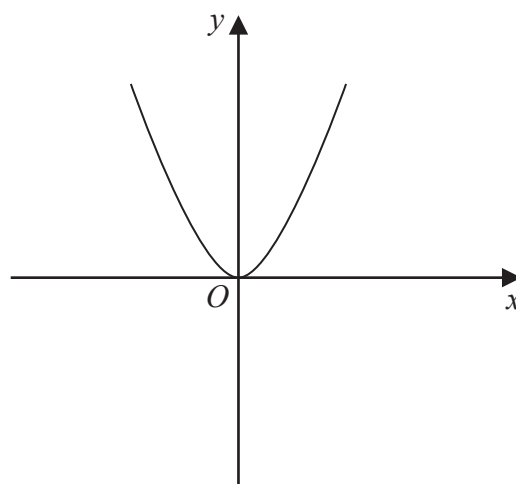
Graph A



Graph B



Graph C



Graph D

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

Complete the table.

$x$	-2	-1	0	1	2	Equation	Letter of graph
$y$	8	1	0	-1	-8	$y = -x^3$	B
$y$	-8	-1	0	1	8	$y = x^3$	C
$y$	4	1	0	1	4	$y = x^2$	D
$y$	$\frac{1}{2}$	-1	-	1	$\frac{1}{2}$	$y = \frac{1}{x}$	A

Doing a table of values for  $x$  values from -2 to 2 can work out which graph is which equation

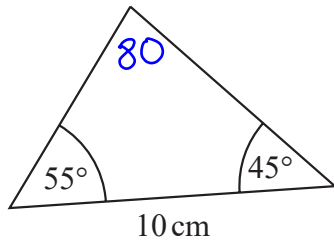
(Total for Question 22 is 2 marks)

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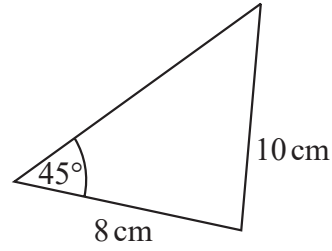
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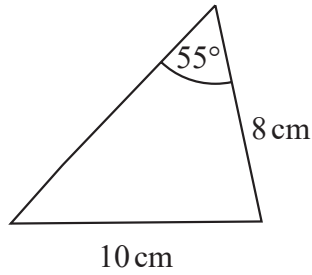
23 The diagram shows four triangles.



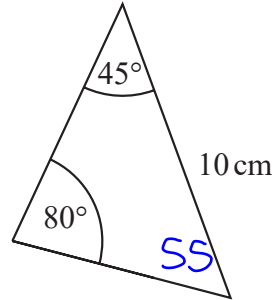
Triangle A



Triangle B



Triangle C



Triangle D

Two of these triangles are **congruent**. All the sides and angles are the same

Write down the letters of these two triangles.

It can't be B or C as the 10cm 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.

$$\frac{12 - 10}{10} \times 100$$

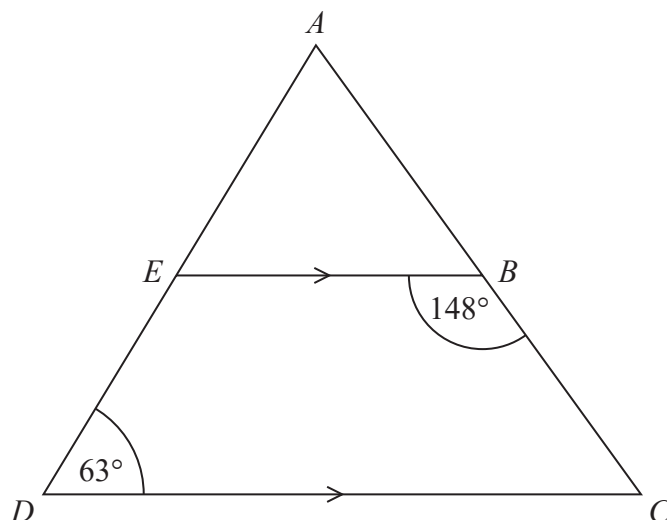
Percentage profit = percentage change = (new - old)/old x 100. The new value is the amount of income he gets. 50p is half of £1 so halving the 24 works out the income in pounds. The old value is the amount he paid

..... 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.

$$180 - 148 = 32$$

Angle  $BCD$  is  $32^\circ$  as co-interior angles sum to 180

EBC is co-interior to BCD

$$180 - 63 - 32 = 85$$

Subtracting angles  $EDC$  and  $BCD$  from the  $180^\circ$  in triangle  $ADC$

Angle  $EAB$  is  $85^\circ$  as angles in a triangle sum to 180

(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 median for the boys is 168, which is higher than the median for the girls, which was 165.

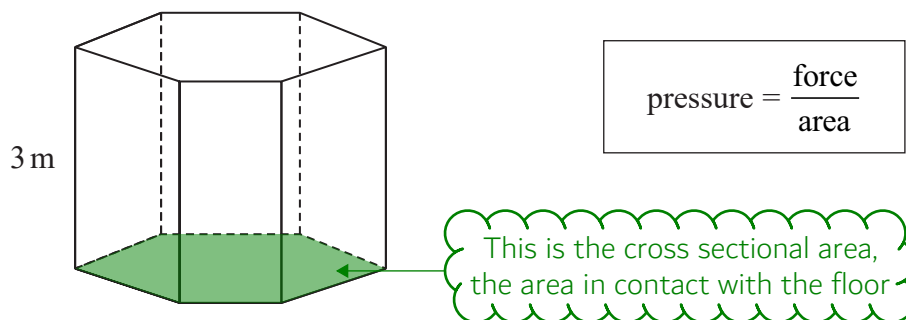
$(15 + 1)/2 = 8$  so the 8th value is the median for the boys. They are arranged in order in the stem and leaf diagram so we can count to the 8th value from the top left to the bottom right

The range for the boys is 24, which is higher than the range for the girls, which was 20.

The greatest value for the boys was 182 and the least was 158. The range is  $182 - 158$  which is 24.  $170 - 150$  is 20 so this is the range for the girls

(Total for Question 26 is 3 marks)

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



The prism has height 3 m

The volume of the prism is  $18\text{ m}^3$

The pressure on the floor due to the prism is  $75\text{ newtons/m}^2$

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

$$F = PA$$

Rearranged to make the force the subject of the formula by multiplying both sides by the area

$$18 \div 3 = 6$$

Volume of prism = cross sectional area  $\times$  length  
Cross sectional area = volume of prism / length  
Cross sectional area =  $18/3$

$$\begin{array}{r} 75 \\ \times 6 \\ \hline 450 \\ \phantom{0} \end{array}$$

Multiplying the pressure by the cross sectional area, which is the area in contact with the floor, to calculate the force

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

(Total for Question 27 is 3 marks)

28 Write these numbers in order of size.

Start with the smallest number.

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

$$\underline{672000} \quad \underline{0.00672} \quad \underline{6720000}$$

$\times 10^n$  means to multiply by 10 n times  
 $\times 10^{-n}$  means to divide by 10 n times

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

(Total for Question 28 is 2 marks)

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

find  $a:b:c$

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

a could be 2 while b could be 5. b could be 3 while c could be 4. Writing these as ratios in columns to see what is in common to both ratios

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  $p = 6q + 7$

$$6q = p - 7$$

Following BIDMAS backward, the addition needs to go first. The opposite of adding 7 is subtracting 7 so this is done to both sides of the equation. Switching the equation around so that the  $q$  terms are on the left

Dividing both sides of the equation by 6 as this is the opposite of multiplying by 6 and makes  $q$  the subject

$$q = \frac{p-7}{6}$$

(2)

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

$$(a^x)^y = a^{xy}$$

$$-2 \times -3 = 6$$

$$m^6$$

(1)

(Total for Question 30 is 3 marks)

**TOTAL FOR PAPER IS 80 MARKS**