

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

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.
- 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  $\frac{3}{10}$  as a percentage.

To convert any fraction to a percentage it should be multiplied by 100. To multiply by a fraction, divide by the denominator then multiply by the numerator.  $3/10 \times 100 = 30$

30 %

(Total for Question 1 is 1 mark)

- 2 Write the following numbers in order of size.  
Start with the smallest number.

8      -7      -10      1      0      -2

The more negative a number is or the less positive it is, the smaller it is

-10, -7, -2, 0, 1, 8

(Total for Question 2 is 1 mark)

- 3 Write  $\frac{9}{100}$  as a decimal.

To convert a fraction to a decimal the numerator should be divided by the denominator. To divide by 100 the decimal point should be moved 2 places to the left

0.09

(Total for Question 3 is 1 mark)

- 4 Write 327 correct to the nearest ten.

The 7 in the units place causes the tens to round up to a 3. Everything after the tens is set to 0

330

(Total for Question 4 is 1 mark)

- 5 Write down the value of  $7^2$

$$7^2 = 7 \times 7$$

49

(Total for Question 5 is 1 mark)

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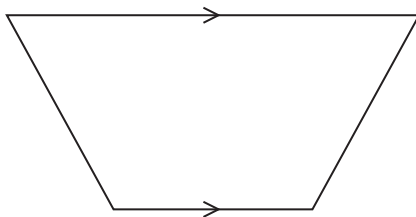


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6 (a) Write down the mathematical name of this quadrilateral.

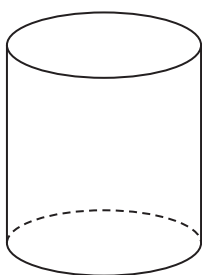


A four sided polygon with one set of parallel sides

Trapezium

(1)

(b) Write down the mathematical name of this 3-D shape.



Cylinder

(1)

(Total for Question 6 is 2 marks)

7 £42 is shared equally between 3 friends.

How much does each friend get?

$$\begin{array}{r} 14 \\ 3 \overline{)42} \end{array}$$

£..... 14

(Total for Question 7 is 2 marks)

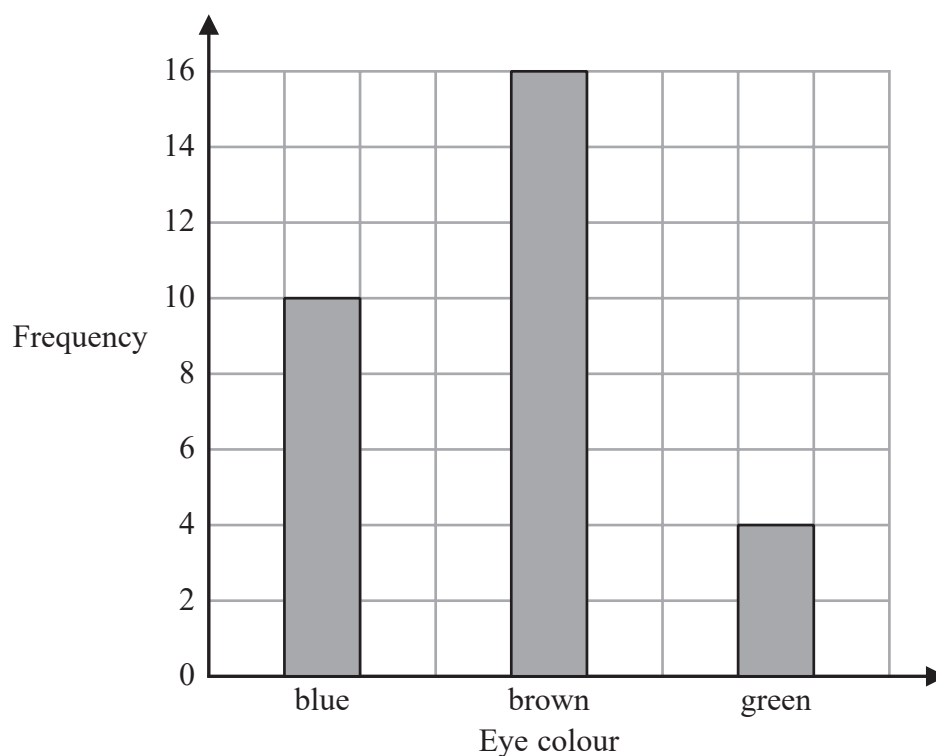


8 Grace recorded the eye colour of each of the students in her class.

The frequency table below shows her results.

Eye colour	Frequency
blue	10
brown	15
green	4

Grace then drew the bar chart below for this information.



Write down one thing that is wrong with this bar chart.

Brown is wrong

As the bar goes up to 16 instead of 15

(Total for Question 8 is 1 mark)

9 Danny buys,

- 1 loaf of bread for £1.20
- 1 bottle of milk for 70p
- 2 packets of cheese for £2.30 each packet

Danny pays with a £10 note.

He says,

“I should get £3.30 change.”

Is Danny correct?

You must show how you get your answer.

$$\begin{array}{r} 1.20 \\ + 0.70 \\ + 2.30 \\ + 2.30 \\ \hline 6.50 \end{array}$$

Adding the prices of all of what he bought works out the total cost

$$10 - 6.50 \neq 3.30$$

Subtracting the total cost from the £10 works out the change and this is not equal to £3.30

No

The change is not £3.30 so Danny is not correct

(Total for Question 9 is 3 marks)

10 Rachel records the temperature in her garden at noon each day.

On Monday, the temperature was  $5^{\circ}\text{C}$ .

On Tuesday, the temperature was  $10^{\circ}$  less than the temperature on Monday.

On Wednesday, the temperature was  $3^{\circ}$  greater than the temperature on Tuesday.

Find the difference between the temperature on Monday and the temperature on Wednesday.

You must show all your working.

$$5 - 10$$

This works out the temperature on Tuesday.  $5 - 10 = -10 + 5 = -5$

$$-5 + 3$$

This works out that the temperature on Wednesday is  $-2^{\circ}\text{C}$

$$5 - -2$$

Difference = largest - smallest

$$5 - -2 = 5 + 2$$

.....  $7^{\circ}\text{C}$

(Total for Question 10 is 2 marks)

- 11 The pictogram shows information about the number of video games sold in a shop on Monday, on Tuesday and on Wednesday.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

**Key:**

represents 8 video games

- (a) How many video games were sold on Monday?

There are 2 whole symbols for Monday and each symbol represents 8 video games.  $8 \times 2 = 16$

16

(1)

More video games were sold on Tuesday than on Wednesday.

- (b) How many more?

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

Dividing the worth of each whole symbol by 4 works out that each quarter of a symbol is worth 2

$$2 \times 6$$

There are 6 more quarters for Wednesday than for Tuesday so this works out how many video games this represents

12

(2)

On Thursday and Friday, a total of 32 video games were sold in the shop.

$\frac{1}{4}$  of these 32 video games were sold in the shop on Thursday.

- (c) Complete the pictogram for Thursday and Friday.

$$\frac{32}{8} = 4$$

This works out that 4 whole symbols represent Thursday and Friday as they are 4 lots of 8 and each symbol represents 8.  $\frac{1}{4}$  of this is 1 so 1 of them is for Thursday

(3)

(Total for Question 11 is 6 marks)

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12 There are two drama groups in a school.

In one group there are 36 boys and 48 girls.

In the other group,  $\frac{3}{7}$  of the students are boys and the rest of the students are girls.

Ann says,

“The ratio of the number of boys to the number of girls is the same for both groups.”

Is Ann correct?

You must show how you get your answer.

$$\frac{36}{36+48} = \frac{3}{7}$$

Expressing the number of boys as a fraction of the number of students in the first group. This fraction simplifies to  $\frac{3}{7}$  as  $36 + 48 = 84$ ,  $36/12 = 3$  and  $84/12 = 7$

Yes

$\frac{3}{7}$  of the students are boys in both groups therefore Ann is correct. The fractions can be converted into ratios and the ratios would be the same

(Total for Question 12 is 3 marks)





13 A number sequence starts 1 2 4

Emma says that the next term is 7

(a) Explain why Emma may be correct.

It could be increasing by an additional 1 between each term

$$\begin{aligned} 1 + 1 &= 2 \\ 2 + 2 &= 4 \\ 4 + 3 &= 7 \end{aligned}$$

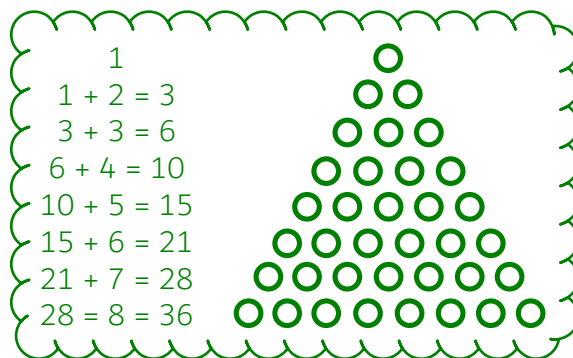
(1)

Here are the first four terms of the sequence of triangle numbers.

1 3 6 10

(b) Find the 8th term of this sequence.

15, 21, 28



36

(2)

(Total for Question 13 is 3 marks)

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14 3 kg of carrots cost £1.80  
 2 kg of carrots and 5 kg of potatoes cost a total of £3.45

Work out the total cost of 4 kg of carrots and 2 kg of potatoes.  
 You must show all your working.

$\begin{array}{r} 0.60 \\ 3 \overline{)1.80} \end{array}$	←	Dividing the £1.80 by 3 works out the cost of 1kg of carrots
$\begin{array}{r} 0.60 \\ \times 2 \\ \hline 1.20 \end{array}$	←	Multiplying the cost of 1kg of carrots by 2 works out the cost of 2kg of carrots
$\begin{array}{r} 3.45 \\ -1.20 \\ \hline 2.25 \end{array}$	←	Subtracting the cost of 2kg of carrots from the total of £3.45 leaves the cost of 5kg of potatoes
$\begin{array}{r} 0.45 \\ 5 \overline{)2.25} \end{array}$	←	Dividing the cost of 5kg of potatoes by 5 works out the cost of 1kg of potatoes
$\begin{array}{r} 0.60 \\ \times 4 \\ \hline 2.40 \end{array}$	←	Multiplying the cost of 1kg of carrots by 4 works out the cost of 4kg of carrots
$\begin{array}{r} 0.45 \\ \times 2 \\ \hline 0.90 \end{array}$	←	Multiplying the cost of 1kg of potatoes by 2 works out the cost of 2kg of potatoes
$\begin{array}{r} 2.40 \\ +0.90 \\ \hline 3.30 \end{array}$	←	Adding the cost of 4kg of carrots and 2kg of potatoes works out the total cost

£..... 3.30 .....

(Total for Question 14 is 4 marks)



15 (a) Expand  $2(a + d)$

$$2a + 2d$$

(1)

(b) Factorise  $6y^2 - 5y$

y is a common factor of both terms so this is brought out as a factor. The rest is left in a bracket by dividing both terms by y

$$y(6y - 5)$$

(1)

(c) Solve  $4x - 7 = 37$

$$4x = 44$$

Adding 7 to both sides gets rid of the -7 on the left to get the x term on its own

Dividing both sides by 4 gets x on its own and solves the equation

$$x = 11$$

(2)

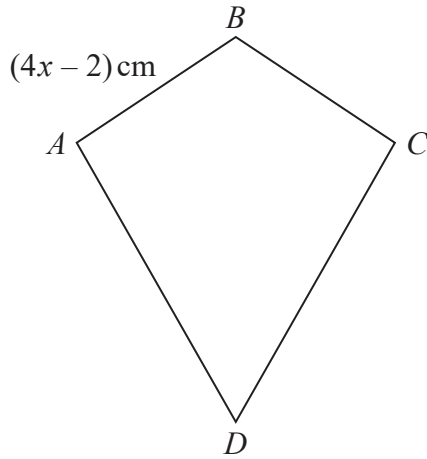
(Total for Question 15 is 4 marks)

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16  $ABCD$  is a kite.



$$AB = (4x - 2) \text{ cm}$$

Jasper says that  $x$  could be 0.5

(a) Explain why Jasper cannot be correct.

$$4 \times 0.5 - 2 = 0$$

Substituting  $x$  for 0.5 finds that length  $AB$  would be 0. The length of a side cannot be 0

(1)

$$AD = 3AB$$

The kite has a perimeter of 64 cm.

(b) Find the value of  $x$ .

$$2(4x - 2) + 2 \times 3(4x - 2)$$

Expressing the perimeter of the kite in terms of  $x$

$AB = BC$  so there is 2 lots of  $(4x - 2)$

$AD = CD$  so there is 2 lots of  $AD$ , which is  $3AB$

$$8x - 4 + 24x - 12$$

Simplifying the expression by doing  $2 \times 3$  and expanding the brackets

$$32x - 16 = 64$$

Simplifying the expression by collecting like terms and setting it equal to the 64 cm

Making  $x$  the subject by adding 16 to both sides then dividing by 32

$$x = \frac{80}{32}$$

(3)

(Total for Question 16 is 4 marks)

17 Heidi wants to make some biscuits using this recipe.

Makes 12 biscuits

125 g butter

200 g flour

50 g sugar

Heidi thinks that she has,

500 g butter

700 g flour

250 g sugar

Assuming that these weights are correct,

- (a) work out the greatest number of biscuits Heidi can make.  
You must show all your working.

$$\begin{array}{r} 4 \\ 125 \overline{) 500} \\ \underline{125} \phantom{00} \\ 375 \phantom{0} \\ \underline{375} \\ 000 \end{array}$$

Dividing the 500g of butter by the 125g needed for every 12 to see how many batches of butter she has

$$\begin{array}{r} 3.5 \\ 2 \overline{) 7.0} \\ \underline{6.0} \\ 1.0 \\ \underline{1.0} \\ 0 \end{array}$$

Dividing the 700g of flour by the 200g needed for every 12 to see how many batches of flour she has.  $700/200$  simplifies to  $7/2$

$$\begin{array}{r} 5 \\ 5 \overline{) 25} \\ \underline{25} \\ 0 \end{array}$$

Dividing the 250g of sugar by the 50g needed for every 12 to see how many batches of sugar she has.  $250/50$  simplifies to  $25/5$

$$\begin{array}{r} 12 \\ \times 3.5 \\ \hline 60 \\ 360 \\ \hline 420 \end{array}$$

She has enough butter for 4 batches, enough flour for 3.5 batches and enough sugar for 5 batches. As 3.5 is the least number of batches, this is the most which can be made.  $3.5 \times 12$  works out how many biscuits this makes

42

(4)

Heidi is wrong.

She has more than 250 g of sugar.

- (b) Does this affect the greatest number of biscuits Heidi can make?  
Give a reason for your answer.

No, as there wouldn't be enough flour to make more

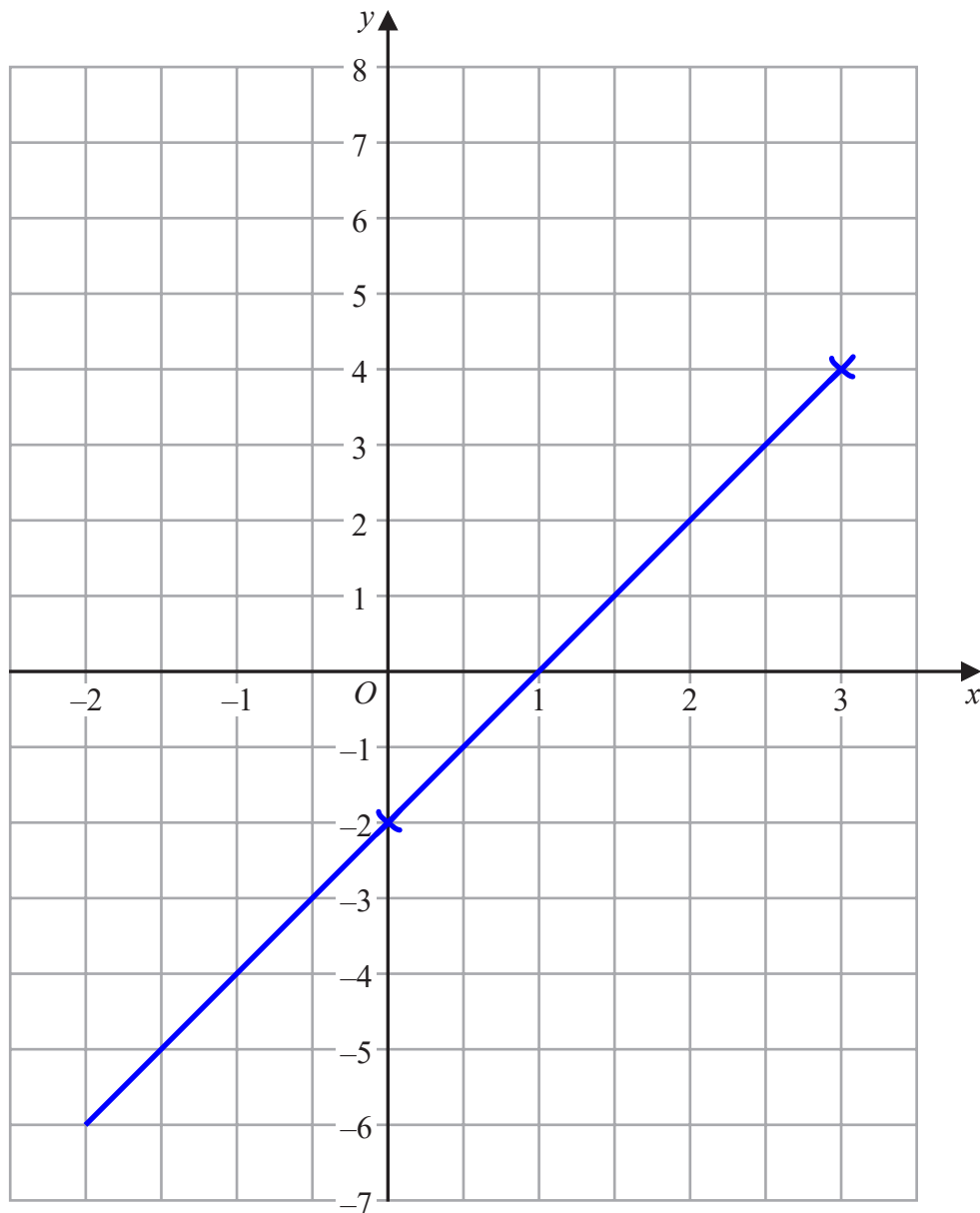
The flour was the ingredient which could produce the least amount of batches and having more sugar does not effect this

(1)

(Total for Question 17 is 5 marks)

18 On the grid below, draw the graph of  $y = 2x - 2$  for values of  $x$  from  $-2$  to  $3$

It is a straight line as it is in the form  $y = mx + c$ . So only two points need to be plotted and then a straight line can be drawn through them. When  $x = 0$ ,  $y = 2(0) - 2 = -2$ . When  $x = 3$ ,  $y = 2(3) - 2 = 4$



(Total for Question 18 is 3 marks)

- 19 Robin buys a watch for £80  
He sells the watch for £56

Work out his percentage loss.

$$\begin{array}{r} 80 \\ -56 \\ \hline 24 \end{array}$$

This works out his loss

$$\frac{24}{80} = \frac{3}{10}$$

Expressing his loss as a fraction of the original value and simplifying the fraction by dividing both the numerator and denominator by 8

Multiplying a fraction by 100 converts it in to a percentage.  $\frac{3}{10} \times 100 = 30$

..... 30 %

(Total for Question 19 is 3 marks)



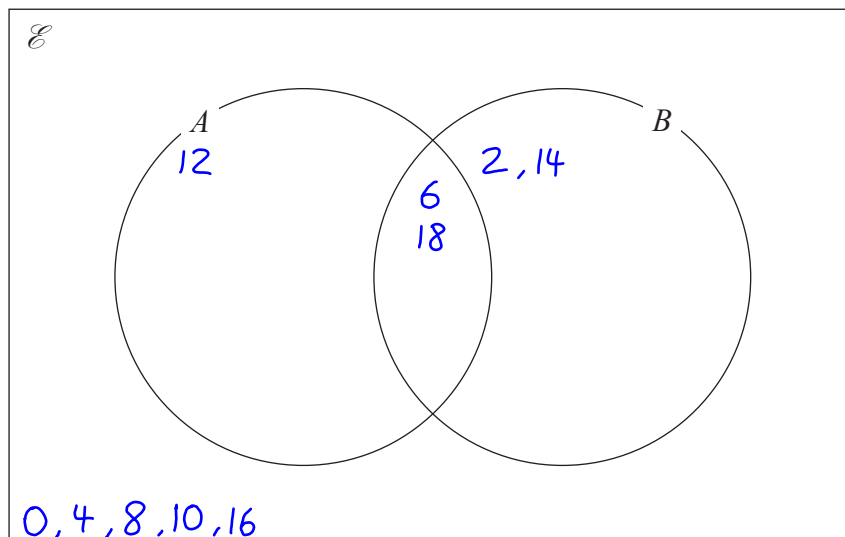


21  $\mathcal{E} = \{\text{even numbers less than 19}\}$

$A = \{6, 12, 18\}$

$B = \{2, 6, 14, 18\}$

Complete the Venn diagram for this information.



(Total for Question 21 is 3 marks)

22 Work out  $4\frac{1}{5} - 2\frac{2}{3}$

Give your answer as a mixed number.

$$\frac{21}{5} - \frac{8}{3}$$

Converting both into improper fractions by multiplying the whole number by the denominator then adding the result to the numerator

$$\frac{63}{15} - \frac{40}{15}$$

Making the denominators the same. A common multiple of 5 and 3 is 15 so multiplying the denominators to get this. Multiplying each numerator by the same amount as their denominator was multiplied by to keep the fractions equivalent

$$\frac{23}{15}$$

Subtracting the numerators and the denominator stays the same

Converted into a mixed number by dividing the numerator by the denominator to find the whole number and leaving the remainder in the fraction

$$1\frac{8}{15}$$

(Total for Question 22 is 3 marks)

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23 At the end of 2017  
 the value of Tamara's house was £220 000  
 the value of Rahim's house was £160 000

At the end of 2019  
 the value of Tamara's house had decreased by 20%  
 the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?  
 You must show how you get your answer.

$$\begin{array}{r} 22000 \\ \times \quad 2 \\ \hline 44000 \end{array}$$

10% of £220000 is £22000, which is found by dividing by 10. Multiplying this by 2 works out 20%

$$\begin{array}{r} 220000 \\ - 44000 \\ \hline 176000 \end{array}$$

Subtracting the value of the 20% from £220000 works out the value of Tamara's house at the end of 2019

$$\begin{array}{r} 16000 \\ \times \quad 3 \\ \hline 48000 \\ + 160000 \\ \hline 208000 \end{array}$$

10% of £160000 is £16000, which is found by dividing by 10. Multiplying this by 3 works out 30%

Adding the value of the 30% to the £160000 works out the value of Rahim's house at the end of 2019

Rahim

Tamara's house was worth £176000 at the end of 2019. Rahim's house was worth £208000 at the end of 2019. Rahim's was worth more

(Total for Question 23 is 4 marks)



24 Rosie, Matilda and Ibrahim collect stickers.

$$\begin{array}{ccc} \text{number of stickers} & \text{number of stickers} & \text{number of stickers} \\ \text{Rosie has} & \text{Matilda has} & \text{Ibrahim has} \end{array} = 4:7:15$$

Ibrahim has 24 more stickers than Matilda.

Ibrahim has more stickers than Rosie.  
How many more?

$15-7$

This works out that Ibrahim has 8 more parts in the ratio than Matilda

$24 \div 8$

8 parts represent 24 stickers so this works out that each part is worth 3 stickers

$15-4$

This works out that Ibrahim has 11 more parts in the ratio than Rosie

$11 \times 3$

This works out how many stickers the 11 parts are worth and therefore how many more stickers Ibrahim has than Rosie

33

(Total for Question 24 is 3 marks)

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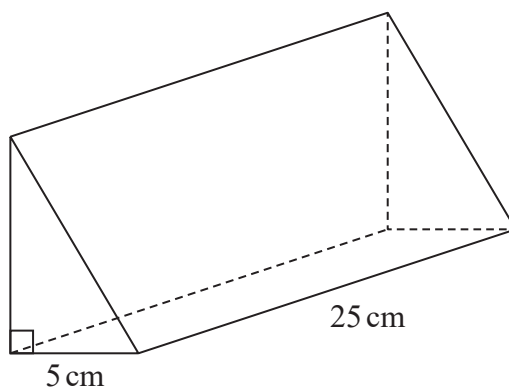
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25 The diagram shows a prism.



The cross section of the prism is a right-angled triangle.  
The base of the triangle has length 5 cm

The prism has length 25 cm  
The prism has volume  $750 \text{ cm}^3$

Work out the height of the prism.

$$\frac{1}{2} \times 5 \times h \times 25 = 750$$

Expressing the volume of the prism in terms of the height,  $h$ , then setting it equal to the actual volume. Volume of prism = area of cross section  $\times$  length. The length is 25cm. The cross section is a triangle. Area of triangle =  $\frac{1}{2} \times$  base  $\times$  height. The base is 5cm. The height is  $h$

$$h = \frac{750}{\frac{1}{2} \times 5 \times 25}$$

Rearranged to make  $h$  the subject by dividing both sides by  $\frac{1}{2}$ , 5 and 25

$$\begin{array}{r} 150 \\ 5 \overline{) 750} \end{array}$$

Dividing the 750 by the 5

$$\begin{array}{r} 030 \\ 5 \overline{) 150} \end{array}$$

Next dividing by the 25 but splitting it into dividing by 5 twice, which works as  $5 \times 5 = 25$

$$30 \div 5$$

$$6 \div \frac{1}{2} = 6 \times 2$$

Next dividing by the  $\frac{1}{2}$ . To divide by a fraction, keep the first number, change the division sign to a multiply and flip the fraction.  $2/1 = 2$

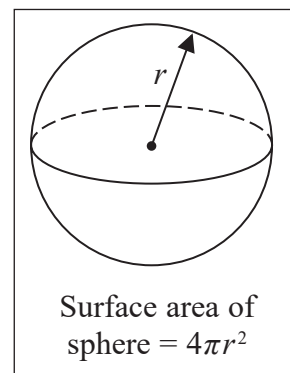
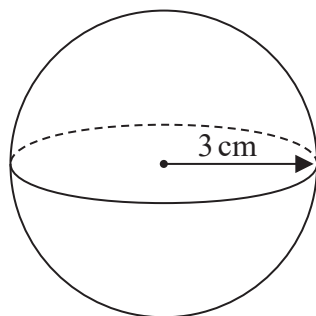
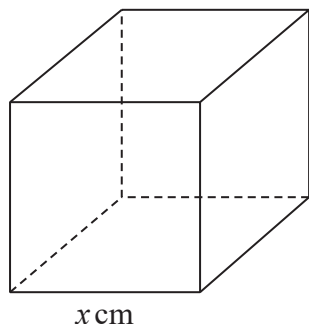
..... 12 ..... cm

(Total for Question 25 is 3 marks)

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26 The diagram shows a cube with edges of length  $x$  cm and a sphere of radius 3 cm.



The surface area of the cube is equal to the surface area of the sphere.

Show that  $x = \sqrt{k\pi}$  where  $k$  is an integer.

$$6x^2 = 4\pi \times 3^2$$

The cube has 6 square faces. Area of square = length<sup>2</sup>. The length is  $x$ . So  $x^2$  is the area of one of the faces. Multiplying this by the 6 faces gives the surface area of the cube, which is  $6x^2$ . This is equal to the surface area of the sphere, which is expressed by using the formula given and substituting in 3cm as the radius

$$x = \sqrt{\frac{36\pi}{6}}$$

Multiplication can be done in any order.  $3^2 = 3 \times 3 = 9$ .  $4 \times 9 = 36$ . So the surface area of the sphere is  $36\pi$ . Dividing both sides by 6 then square rooting makes  $x$  the subject

$$= \sqrt{6\pi}$$

$$36/6 = 6$$

(Total for Question 26 is 4 marks)

27 Freddie measured the length of a pencil as 7.2 cm correct to 1 decimal place.

Complete the error interval for the length,  $p$  cm, of the pencil.

Finding the bounds by adding and subtracting half of the resolution. The resolution is 0.1 as it is correct to 1 decimal place.  $0.1/2 = 0.05$ .  $7.2 - 0.05 = 7.15$ .  $7.2 + 0.05 = 7.25$

$$\dots\dots\dots 7.15 \dots\dots\dots \leq p < \dots\dots\dots 7.25 \dots\dots\dots$$

(Total for Question 27 is 2 marks)



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28 The equation of a straight line **L** is  $y = 3 - 4x$

(i) Write down the gradient of **L**.

The general equation of a straight line is  $y = mx + c$ , where  $m$  is the gradient and  $c$  is the  $y$ -intercept. The equation can be written as  $y = -4x + 3$  so  $m = -4$

.....  
-4  
.....  
(1)

(ii) Write down the coordinates of the point where **L** crosses the  $y$ -axis.

When the line crosses the  $y$ -axis,  $x$  is 0.  $y = 3 - 4(0) = 3$

(.....0.....,.....3.....)  
(1)

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

