

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 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 $\frac{3}{10}$ 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. $3/10 \times 100 = 10 \times 3 = 30$

..... 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 then 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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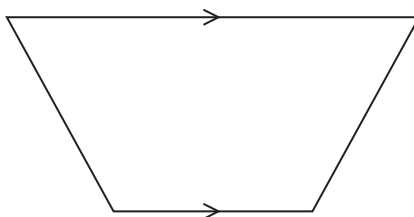


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6 (a) Write down the mathematical name of this quadrilateral.

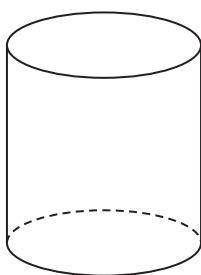


A four-sided polygon with one set of parallel sides

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?

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

Dividing the £42 by the 3 friends

£ 14

(Total for Question 7 is 2 marks)

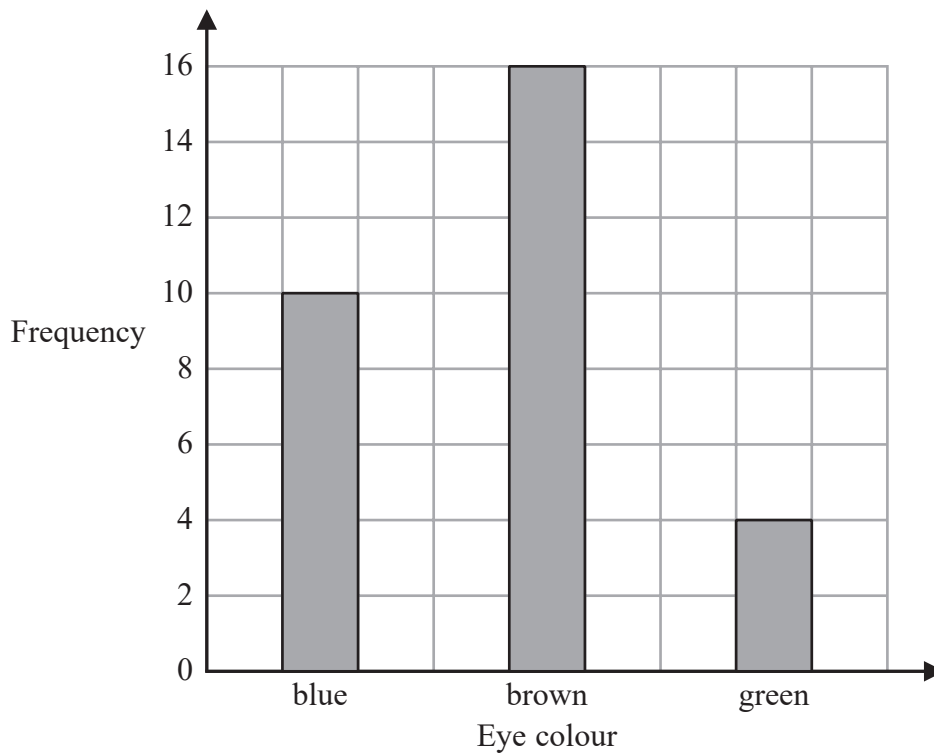


8 Grace recorded the eye colour of each of the students in her class.

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)

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- 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 that the total cost is £6.50

$$10 - 6.50 \neq 3.30$$

← 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°C.

On Tuesday, the temperature was 10° less than the temperature on Monday.

On Wednesday, the temperature was 3° 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°C

$$5 - -2$$

← Difference = largest - smallest



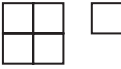

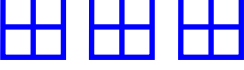
$$5 - -2 = 5 + 2$$

..... 7 °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 multiplying the value of each quarter symbol by 6 works out how many more video games were sold on Wednesday

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.

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

Dividing the 32 video games by the 8 which each symbol represents finds that there will be 4 symbols in total for Thursday and Friday. $\frac{1}{4}$ of these are for Thursday so Thursday will have 1 symbol

(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.

36 : 48 ← Writing the ratio of boys to girls in the one group

3 : 4 ← Simplifying the ratio by dividing both sides by 12

$\frac{3}{7} : \frac{4}{7}$ ← Writing the ratio of boys to girls in the the other group

3 : 4 ← Simplifying the ratio by multiplying both sides by 7

Yes ← Both ratios are 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

$$\begin{array}{l} 1 + 1 = 2 \\ 2 + 2 = 4 \\ 4 + 3 = 7 \end{array}$$

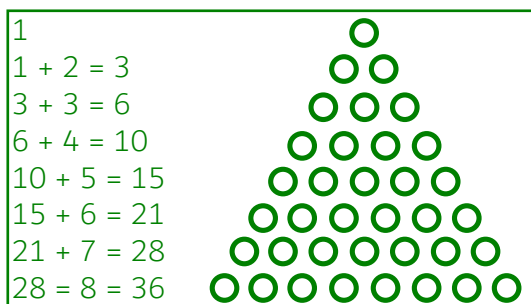
(1)

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 that the cost of 1kg of carrots is £0.60

$$\begin{array}{r} 0.60 \\ \times 2 \\ \hline 1.20 \end{array}$$

← Multiplying the cost of 1kg of carrots by 2 works out that the cost of 2kg of carrots is £1.20

$$\begin{array}{r} 3.45 \\ -1.20 \\ \hline 2.25 \end{array}$$

← Subtracting the cost of 2kg of carrots from the total of £3.45 finds that the cost of 5kg of potatoes is £2.25

$$\begin{array}{r} 0.45 \\ 5 \overline{)2.25} \end{array}$$

← Dividing the cost of 5kg of potatoes by 5 works out that the cost of 1kg of potatoes is £0.45

$$\begin{array}{r} 0.60 \\ \times 4 \\ \hline 2.40 \end{array}$$

← Multiplying the cost of 1kg of carrots by 4 works out that the cost of 4kg of carrots is £2.40

$$\begin{array}{r} 0.45 \\ \times 2 \\ \hline 0.90 \end{array}$$

← Multiplying the cost of 1kg of potatoes by 2 works out that the cost of 2kg of potatoes is £0.90

$$\begin{array}{r} 2.40 \\ +0.90 \\ \hline 3.30 \end{array}$$

← Adding the cost of 4kg of carrots and 2kg of potatoes works out that the total cost is £3.30

£..... 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. Dividing both terms by y and leaving the result in a bracket

$$y(6y - 5)$$

(1)

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

$$4x = 44 \leftarrow \text{Adding 7 to both sides eliminates the } -7 \text{ on the left and gets the } x \text{ term on its own}$$

Dividing both sides by 4 gets x on its own

$$x = \dots\dots\dots 11$$

(2)

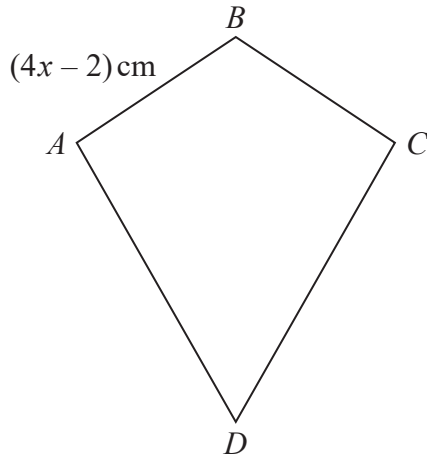
(Total for Question 15 is 4 marks)

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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 0.5 for x 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 .

$$3(4x - 2) = 12x - 6 \leftarrow \text{Multiplying } AB \text{ by } 3 \text{ finds that } AD \text{ is } (12x - 6) \text{ cm}$$

$$4x - 2 + 4x - 2 + 12x - 6 + 12x - 6 \leftarrow \text{Adding all the outside sides expresses the perimeter. } BC \text{ is the same as } AD \text{ and } CD \text{ is the same as } AD \text{ as it is a kite}$$

$$32x - 16 = 64 \leftarrow \text{Collecting like terms and setting equal to the value of the perimeter}$$

$$32x = 80 \leftarrow \text{Adding } 16 \text{ to both sides eliminates the } -16 \text{ on the left and gets the } x \text{ term on its own}$$

$$32 \overline{) 80.160} \leftarrow \text{Dividing both sides by } 32 \text{ gets } x \text{ on its own}$$

$$32, 64, 96, 128, 160 \leftarrow \text{Listing the } 32 \text{ times table helps with the division}$$

$$x = \dots\dots\dots 2.5 \dots\dots\dots$$

(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.

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

Dividing the 500 g of butter by the 125 g 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 700 g of flour by the 200 g 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 250 g of sugar by the 50 g 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. 3.5×12 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)

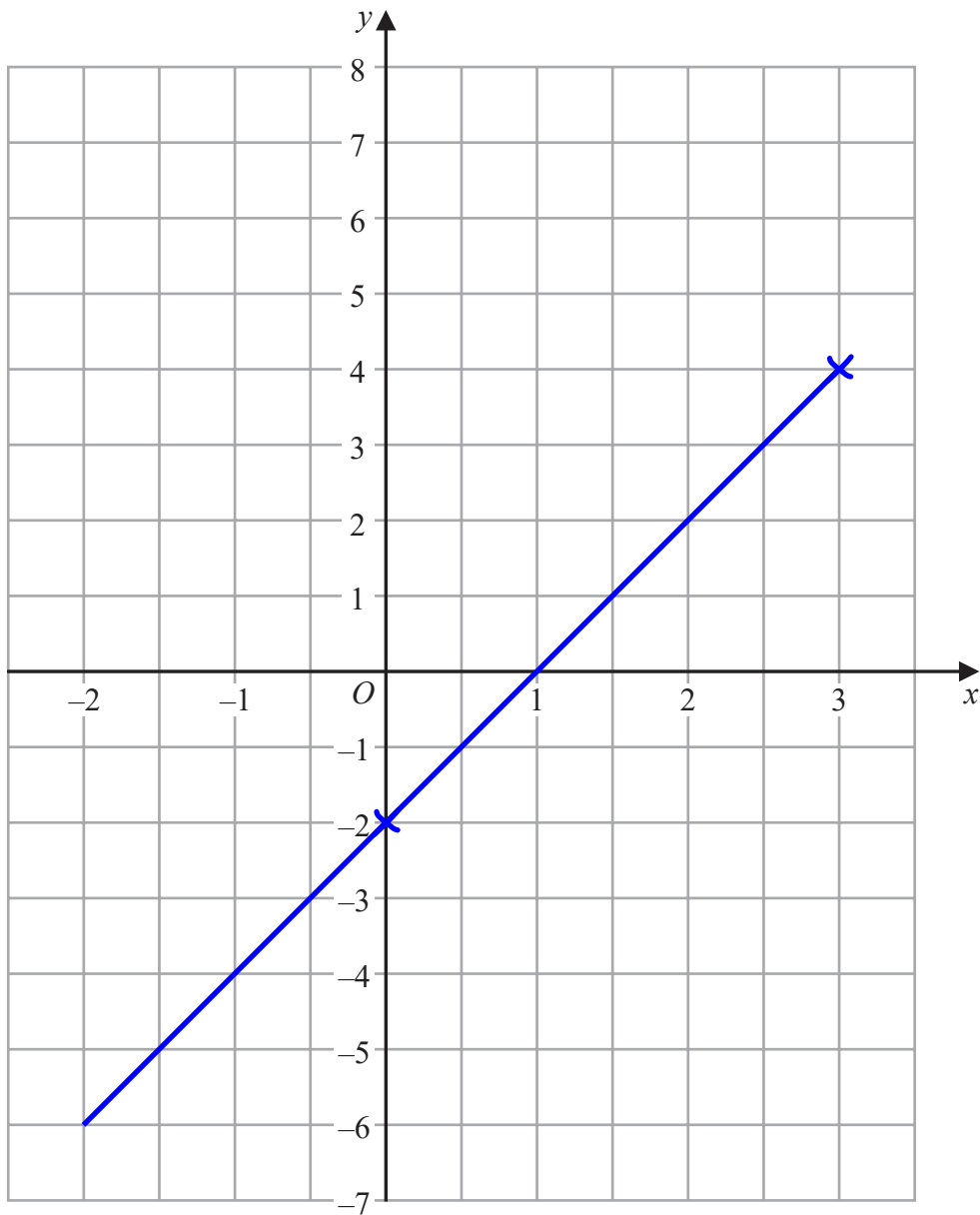
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18 On the grid below, draw the graph of $y = 2x - 2$ for values of x from -2 to 3

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.

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

← Subtracting the £56 from the £80 works out that the loss was £24

$$\frac{24}{80}$$

← Expressing the loss as a fraction of the original value

$$\frac{3}{10}$$

← Simplifying the fraction by dividing both the numerator and denominator by 8

1/10 is 10% so 3/10 is 30%

..... 30 %

(Total for Question 19 is 3 marks)

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20 (a) Work out 3.67×4.2

$$\begin{array}{r}
 367 \\
 \times 42 \\
 \hline
 734 \\
 14680 \\
 \hline
 15414
 \end{array}$$

Ignoring the decimals and doing 367×42

There are 2 decimal places in 3.67 and 1 decimal place in 4.2. There are 3 decimal places in total. So moving the decimal point 3 places to the left

$$15.414$$

(3)

(b) Work out $59.84 \div 1.6$

$$16 \overline{) 037.4} \begin{array}{l} 59 \\ 84 \end{array}$$

Multiplying both 59.84 and 1.6 by 10 eliminates the decimal in 1.6 and makes an equivalent division which is easier

$$16, 32, 48, 64, 80, 96, 112, 128$$

Listing the 16 times table helps with the division

$$37.4$$

(3)

(Total for Question 20 is 6 marks)

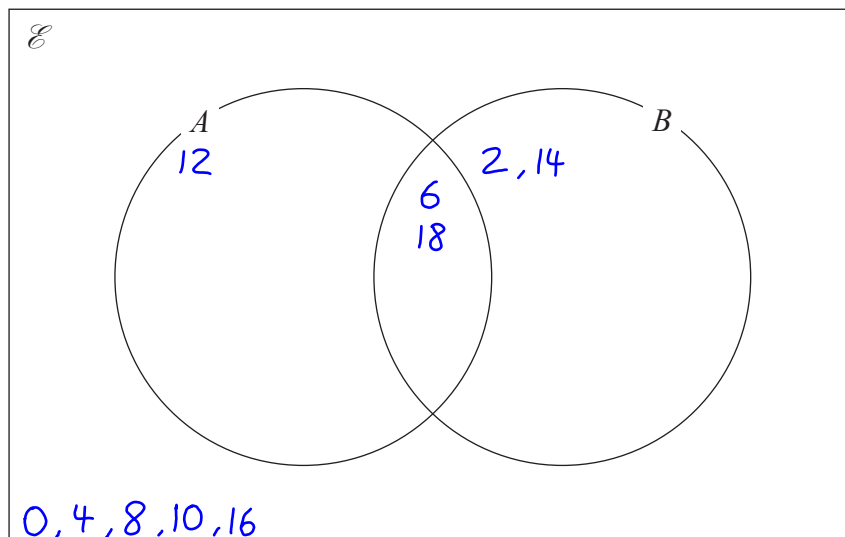


21 $\mathcal{E} = \{\text{even numbers less than 19}\}$

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

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

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

Converting 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.

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

10% of £220000 is £22000, which is found by dividing by 10. Multiplying this by 2 works out that 20% is worth £44000

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

Subtracting the value of the 20% from £220000 works out that the value of Tamara's house at the end of 2019 is £176000

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

10% of £160000 is £16000, which is found by dividing by 10. Multiplying this by 3 works out that 30% is worth £48000

Adding the value of the 30% to the £160000 works out that the value of Rahim's house at the end of 2019 is £208000

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.

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

Ibrahim has 24 more stickers than Matilda.

Ibrahim has more stickers than Rosie.

How many more?

$15-7$

Subtracting the 7 parts Matilda gets from the 15 parts Ibrahim gets finds that Ibrahim has 8 more parts in the ratio than Matilda

$24 \div 8$

Dividing the 24 stickers by the 8 parts which represent them finds that 1 part of the ratio is worth 3 stickers

$15-4$

Subtracting the 4 parts Rosie gets from the 15 parts Ibrahim gets finds that Ibrahim has 11 more parts in the ratio than Rosie

11×3

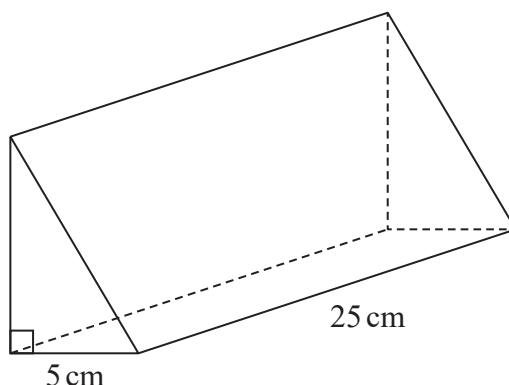
Multiplying the 11 parts Ibrahim gets more than Rosie by the value of 1 part of the ratio finds that Ibrahim gets 33 more sticker than Rosie

33

(Total for Question 24 is 3 marks)

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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 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 25 cm. The cross section is a triangle. Area of triangle = $\frac{1}{2} \times$ base \times height. The base is 5 cm. The height is h

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

Rearranging to get h on its own 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 to a multiplication and flip the fraction. $2/1 = 2$

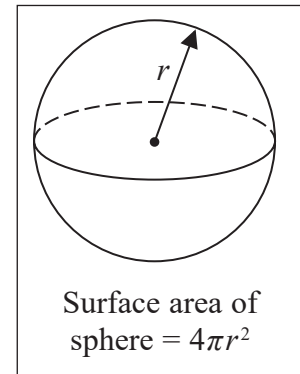
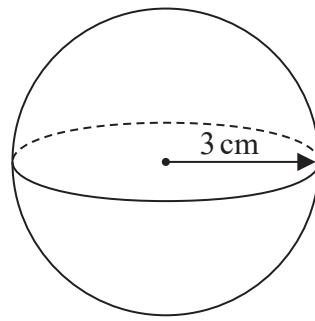
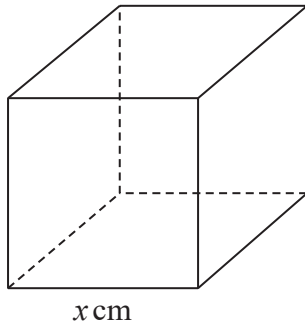
..... 12 cm

(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 = length². The length is x . So x^2 cm² is the area of one of the faces. Multiplying this by the 6 faces gives the surface area of the cube, which is $6x^2$ cm². This is equal to the surface area of the sphere, which is expressed by using the formula given and substituting in 3 cm 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 36π . Dividing both sides by 6 then square rooting gets x on its own

$$= \sqrt{6\pi} \quad \leftarrow \quad 36/6 = 6$$

(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, $x = 0$. $y = 3 - 4(0) = 3$

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

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

