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)

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 ▶

P64629A

E:1/1/1/1/1/1/

P 6 4 6 2 9 A 0 1 2 4

Pearson

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 fractions to percentage, we need to multiply 100%

$\frac{3}{10} \times 100\% = 30\%$

30 (1)

.....%

(Total for Question 1 is 1 mark)

---

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

smallest (highest negative integer)

8 −7 −10 1 0 −2

largest (highest positive integer)

Increasing numbers :

negative integers, 0, positive integers

−10 −7 −2 0 1 8 (1)

.....

(Total for Question 2 is 1 mark)

---

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

$0.09 \div 100 = 0.09$

0.09 (1)

.....

(Total for Question 3 is 1 mark)

---

4 Write 327 correct to the nearest ten.

327

tenths ↙

7 > 5, so we need to round up : 330

330 (1)

.....

(Total for Question 4 is 1 mark)

---

5 Write down the value of 7^2

$7^2 = 7 \times 7 = 49$

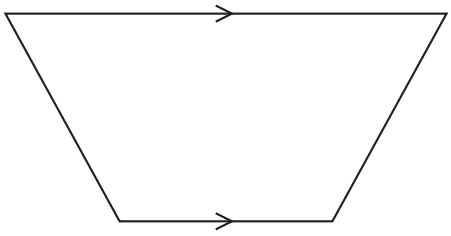
49 (1)

.....

(Total for Question 5 is 1 mark)

---

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



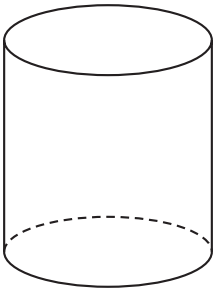
- 4 sides
- 4 vertices
- 2 opposite sides parallel to each other

↳ Trapezium

Trapezium (1)

(1)

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



→ circular prism = cylinder

Cylinder (1)

(1)

(Total for Question 6 is 2 marks)

---

7 £42 is shared equally between 3 friends.

How much does each friend get?

£42 ÷ 3

= £14 (1)

$$\begin{array}{r} 14 \\ 3\overline{)42} \\ 3 \\ \hline 12 \\ 12 \\ \hline \end{array}$$

£ 14 (1)

(Total for Question 7 is 2 marks)

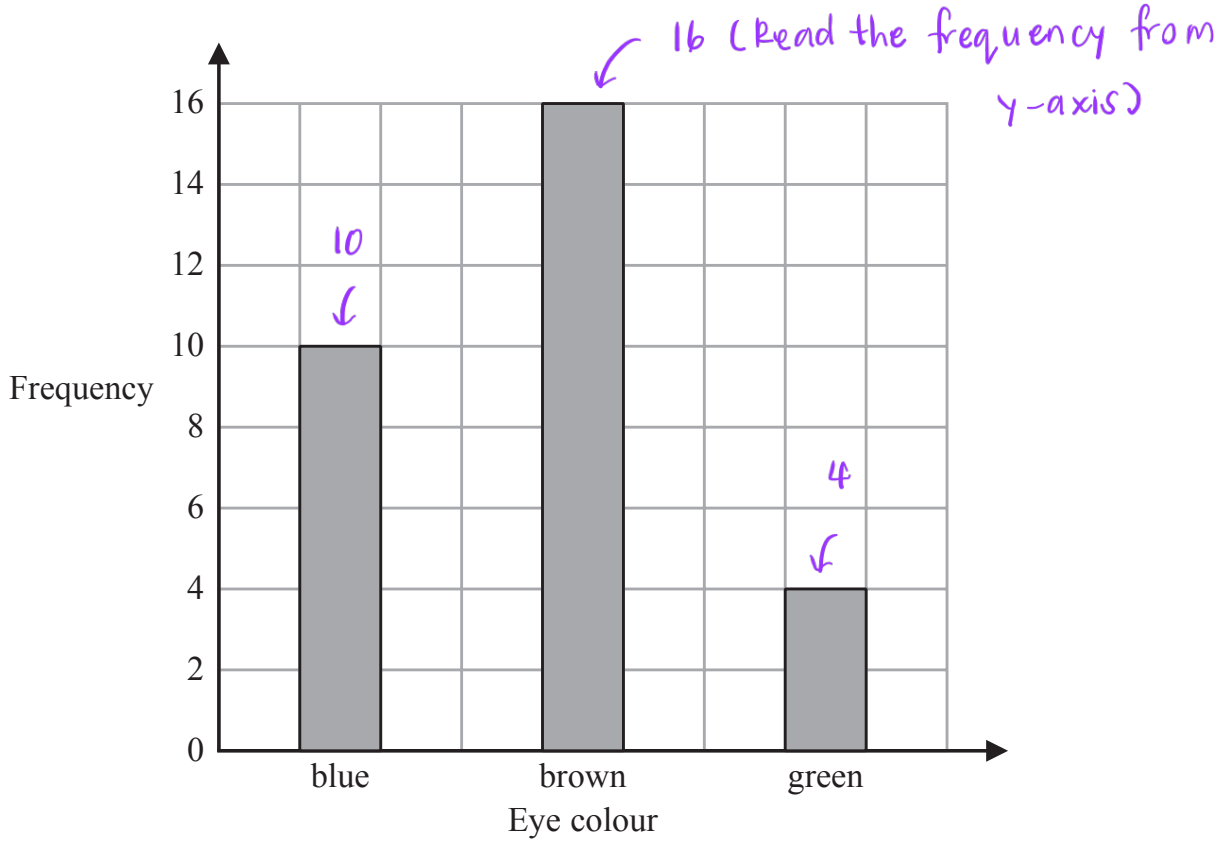
---

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.

Frequency of brown should be 15 instead of 16 on the bar chart. (1)

(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.

Total = 1.20 + 0.70 + 2 × 2.30
= 1.20 + 0.70 + 4.60
= 6.50 (1)

According to BIDMAS, we need to multiply this first before adding

Change = 10.00 − 6.50
= £3.50 (1)

∴ No, Danny is wrong. (1)

(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.

Temperature : Monday = 5°C

Tuesday = 5°C − 10°C
= −5°C

Wednesday = −5°C + 3°C
= −2°C (1)

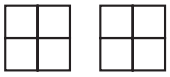
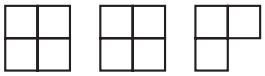
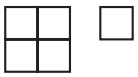
When 2 symbols meet:
(−)(−) = +
(−)(+) = −
(+)(+) = +
(+)(−) = −

Difference between Monday and Wednesday : 5°C − (−2°C)
= 5°C + 2°C
= 7°C (1)

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

 = 8

 = 2

one square

3

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

2 × 8 video games

= 16 (1)

16

(1)

More video games were sold on Tuesday than on Wednesday.

(b) How many more?

Tuesday = 8 + 8 + 6

= 22 (1)

Wednesday = 8 + 2

= 10

Tuesday - Wednesday = 22 - 10

= 12 (1)

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.

1 big square

Thursday sales = $\frac{1}{4}$ × 32 = 8

24 ÷ 8 = 3 big squares

Friday sales = 32 - 8 = 24

one big square

(3)

(Total for Question 11 is 6 marks)

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.

Group 1 : 36 boys + 48 girls

= 84

Boy ratio = $\frac{36 \div 12}{84 \div 12} = \frac{3}{7}$ (1)

simplify the ratio by dividing them with the highest common multiple

Girl ratio = $\frac{48 \div 12}{84 \div 12} = \frac{4}{7}$

Group 2 : Boy ratio = $\frac{3}{7}$

Girl ratio = $\frac{7}{7} - \frac{3}{7} = \frac{4}{7}$

} same as group 1

total of a fraction = 1

∴ Yes, Ann is correct (1)

(Total for Question 12 is 3 marks)

13 A number sequence starts 1 2 4 7 (+1, +2, +3) 4 + 3 = 7

Emma says that the next term is 7

(a) Explain why Emma may be correct.

The sequence is going +1, +2, so the next one should be +3. So, next term after 4 is 7. (1)

(1)

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

1 (+2) 3 (+3) 6 (+4) 10

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

1 2 3 4 5 6 7 8

1 3 6 10 15 21 28 36

+2 +3 +4 +5 +6 +7 +8 (1)

The 8th term is 36. (1)

36

(2)

(Total for Question 13 is 3 marks)

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.

1 kg of carrots = £1.80 ÷ 3
= £0.60 (1)

2kg of carrots + 5 kg of potatoes = £3.45

5 kg of potatoes = £3.45 − 2(£0.60) → Rearrange the equation so the potatoes are on one side
= £2.25

1 kg of potato = £2.25 ÷ 5
= £0.45 (1)

multiply the terms first

Total cost of 4 kg of carrots and 2 kg of potatoes = (4 × 0.60) + (2 × 0.45) (1)
= 2.40 + 0.90
= £3.30 (1)

£ 3.30

(Total for Question 14 is 4 marks)

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

$2(a+d) = 2a + 2d$

$2a + 2d$ (1)

(1)

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

To factorise, find the common term

$6y^2 - 5y$

$y(6y - 5)$

y is the common term, so it'll be placed outside the bracket

$y(6y - 5)$ (1)

(1)

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

$4x = 37 + 7$ → Rearrange the equation to place the unknown on one side

$4 \div 4x = 44 \div 4$ (1)

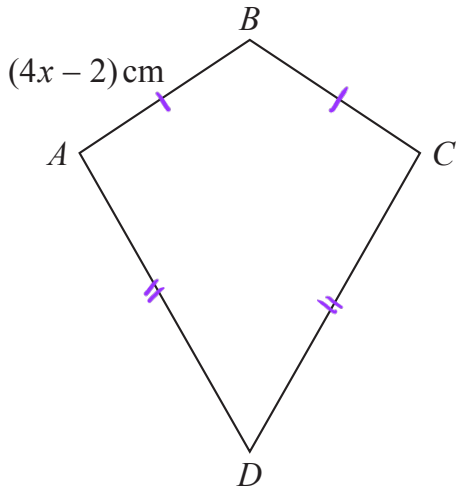
$x = 11$ (1)

$x =$ 11

(2)

(Total for Question 15 is 4 marks)

16 *ABCD* is a kite.



Based on what we know about the properties of a kite:

AB = BC

AD = CD

$AB = (4x - 2)$ cm

Jasper says that x could be 0.5

(a) Explain why Jasper cannot be correct.

AB = (4(0.5) - 2) cm = 2 - 2 = 0 cm

Length of AB cannot be 0. (1)

substitute the value of x into the equation

(1)

$AD = 3AB$

The kite has a perimeter of 64 cm.

(b) Find the value of x.

AD = 3(4x - 2)

= 12x - 6 (1)

Perimeter = AB + BC + CD + AD

= 2AB + 2AD (because AB = BC and CD = AD)

64 = 2(4x - 2) + 2(12x - 6) (1)

64 = 8x - 4 + 24x - 12

64 = 32x - 16

80 = 32x

$x = \frac{80}{32} = 2.5$ (1)

$32 \overline{)80.0}$ → 64, 160, 160

$x =$ 2.5

(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.

1 batch : 12 biscuits

For 500 g butter : $\frac{500\text{ g}}{125\text{ g}}$ = 4 batch

= 4 × 12 = 48 biscuits

For 700 g flour : $\frac{700\text{ g}}{200\text{ g}}$ = 3.5 batch

= 3.5 × 12 = 42 biscuits

For 200 g sugar : $\frac{250\text{ g}}{50\text{ g}}$ = 5 batch

= 5 × 12 = 60 biscuits

$200 \overline{)7000}$ = 3.5 (600, 1000, 1000)

She can only make a max of 42 because she only has enough flour for 42

42

(4)

Heidi is wrong.
She has more than 250 g of sugar.

∴ Heidi can make maximum of 42 biscuits.

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

No. She only has flour enough to make 42 biscuits

(1)

The flour is the limiting factor

(1)

(Total for Question 17 is 5 marks)

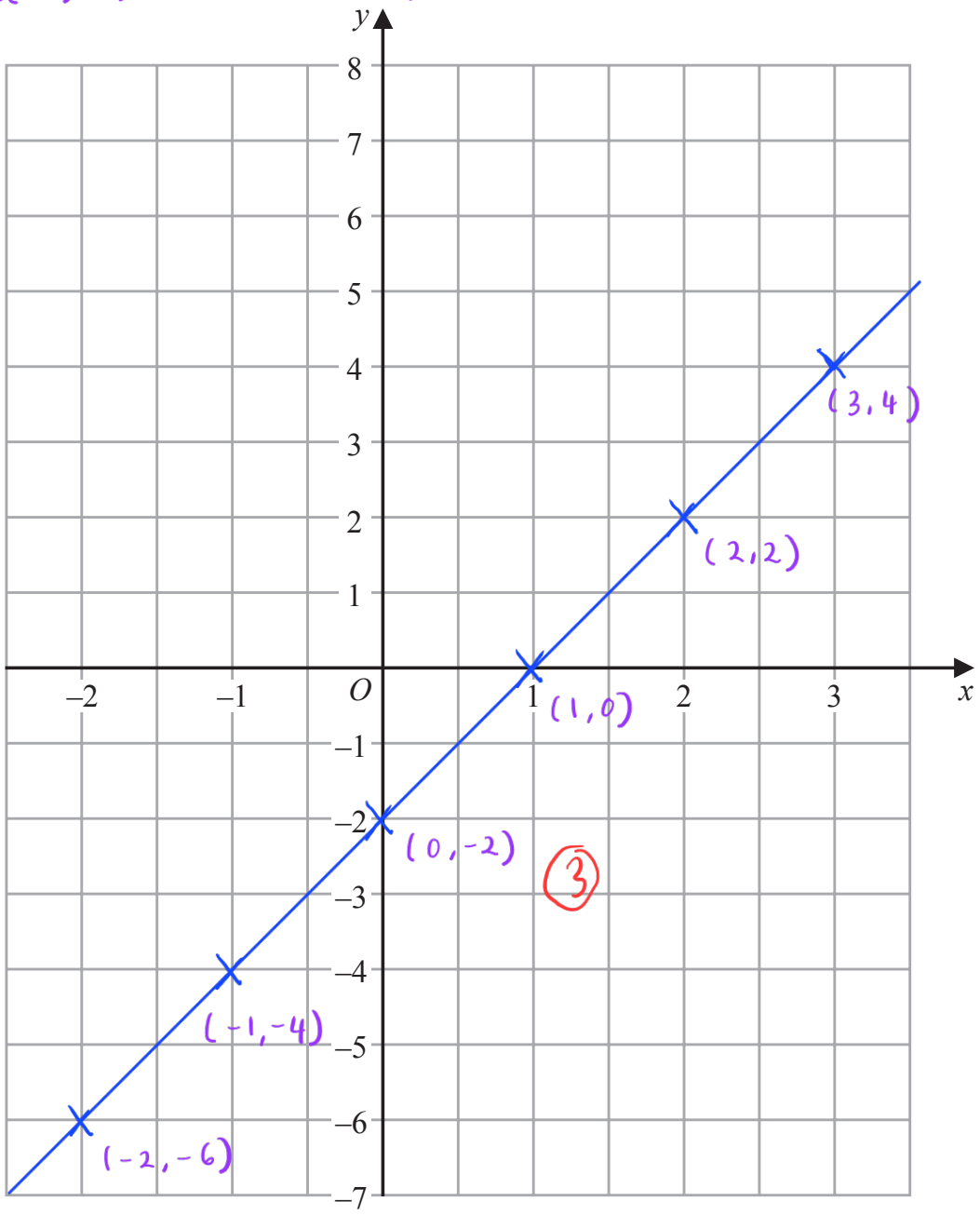
18 On the grid below, draw the graph of $y = 2x - 2$ for values of x from –2 to 3

x	–2	–1	0	1	2	3
y	–6	–4	–2	0	2	4

(substitute these values into the equation to find y)

$y = 2(-2) - 2 = -4 - 2 = -6$

$y = 2(-1) - 2 = -2 - 2 = -4$



3

(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.

$$\text{Percentage loss} = \frac{\text{loss}}{\text{initial price}} \times 100\ \%$$

$\text{Loss} = 56 - 80$

$= -24$ (1)

$\text{Percentage loss} = \frac{24}{80} \times 100\%$ (1)

$= 30\%$ (1)

30 ..... %

(Total for Question 19 is 3 marks)

20 (a) Work out 3.67×4.2

$$\begin{array}{r} 3.67 \\ \times \quad 4.2 \\ \hline 734 \\ +\ 1468 \\ \hline 15.414 \end{array}$$

(1)

multiply the numbers as usual without taking account the decimal point

Place the decimal point in the answer. The total decimal places in the answer will be the sum of decimal places of both terms.

3.67 has 2 d.p, 4.2 has 1 d.p, answer will have 3 d.p.

15.414 (1)

(3)

(b) Work out $59.84 \div 1.6$

$\times 10 \quad \times 10$

multiply both terms by 10 to convert 1.6 to an integer

$$\begin{array}{r} 37.4 \\ 16\overline{)598.4} \\ -48 \\ \hline 118 \\ -112 \\ \hline 6.4 \\ -6.4 \\ \hline \end{array}$$

(1) (1)

37.4 (1)

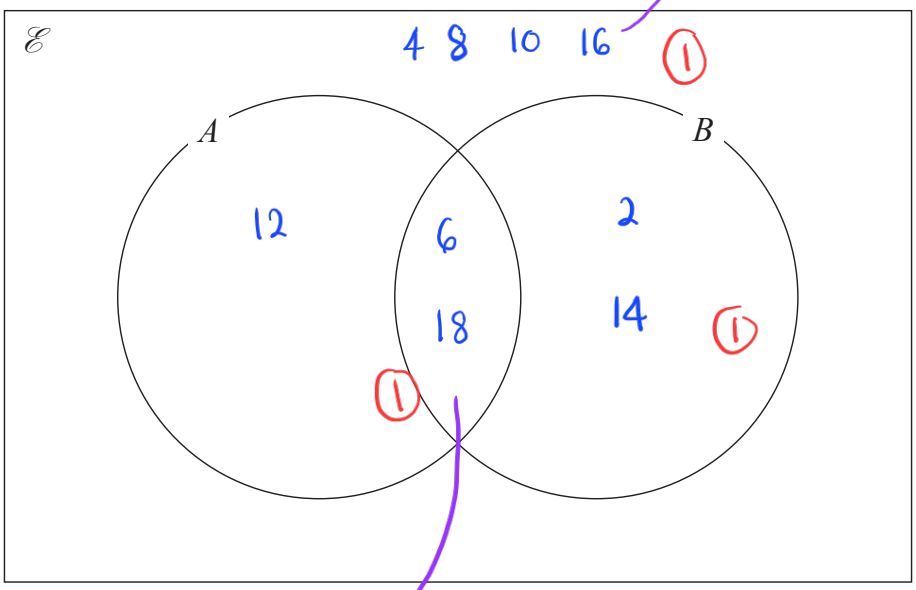
(3)

(Total for Question 20 is 6 marks)

21 $\mathscr{E}$ = {even numbers less than 19}
A = {6, 12, 18}
B = {2, 6, 14, 18}

list down even numbers < 19 :
{ 2, 4, 6, 8, 10, 12, 14, 16, 18 }

Complete the Venn diagram for this information.



numbers that aren't in both sets A and B

overlapping numbers in both sets A and B

(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.

$4\frac{1}{5} - 2\frac{2}{3}$

convert to improper fraction

$= \frac{21}{5} - \frac{8}{3}$ (1)

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

standardise the denominators by multiplying them with each other

$= \frac{63}{15} - \frac{40}{15}$ (1)

$= \frac{23}{15} = 1\frac{8}{15}$ (1)

$15 \overline{)23}$ 1, remainder 8

$1\frac{8}{15}$

(Total for Question 22 is 3 marks)

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.

substract with percentage x initial decrease value

At the end of 2019 :

Tamara's House $= 220\,000 - \frac{20}{100}(220\,000)$ (1)

$= 220\,000 - 20 \times 2200$

$= 220\,000 - 44000$

$= 176\,000$ (1)

Rahim's House $= 160000 + \frac{30}{100}(160\,000)$

add with percentage x initial increase value

$= 160000 + 30 \times 1600$

$= 160\,000 + 48000$

$= 208\,000$ (1)

(1)

∴ Rahim's house had the greater value at the end of 2019.

(Total for Question 23 is 4 marks)

24 Rosie, Matilda and Ibrahim collect stickers.

$$\underset{\text{Rosie has}}{\text{number of stickers}} : \underset{\text{Matilda has}}{\text{number of stickers}} : \underset{\text{Ibrahim has}}{\text{number of stickers}} = 4:7:15$$

Ibrahim has 24 more stickers than Matilda.

Ibrahim has more stickers than Rosie.
How many more?

Difference between Ibrahim's part and Matilda's part : $15 - 7 = 8$ (1)

1 part $= \frac{24}{8} = 3$ stickers

Difference between Ibrahim and Rosie : $15 - 4 = 11$ (1)

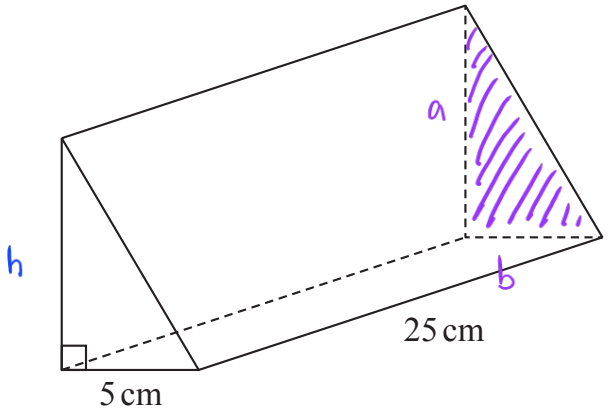
11×3 stickers

$= 33$ stickers (1)

33

(Total for Question 24 is 3 marks)

25 The diagram shows a prism.



Area of triangle = $\frac{1}{2} \times a \times b$

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.

Area of cross section : $\frac{1}{2} \times h \times 5$ (1)

Volume of prism = Area of cross section x length

multiply both sides by 2 → $750\ cm^3 = \frac{1}{2} \times h \times 5\ cm \times 25\ cm$ (1)

$1500\ cm^3 = h \times 5\ cm \times 25\ cm$

Rearrange equation to place unknown on one side →

$h = \frac{1500\ cm^3}{(5 \times 25)cm^2}$

$= \frac{1500\ cm^3}{125\ cm^2}$

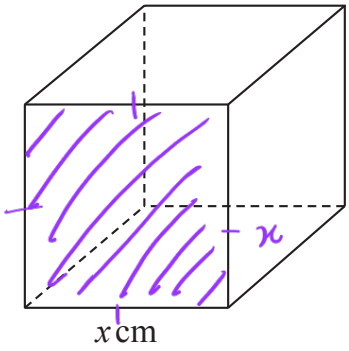
$= 12\ cm$ (1)

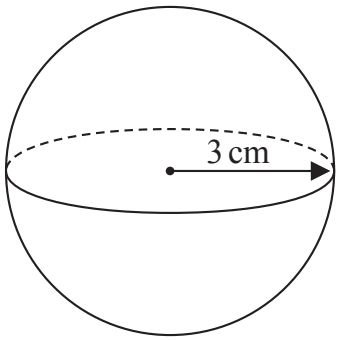
$125 \overline{)1500}$ → 12, 125, 250, 250

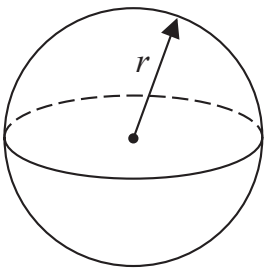
12 ..... cm

(Total for Question 25 is 3 marks)

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







Surface area of sphere $= 4\pi r^2$

6 surface

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.

total surface × area of 1 surface = $6 \times x^2$

Surface area of cube $= 6x^2$ cm^2 (1)

Surface area of sphere $= 4\pi (3\text{ cm})^2$ $r = 3$ cm

$= 4\pi (9\text{ cm}^2)$

$= 36\pi$ cm^2 (1)

Surface area of cube = surface area of sphere

$6x^2 = 36\pi$ (1)

$x^2 = 6\pi$

$x = \sqrt{6\pi}$, where $k = 6$

$x = \sqrt{k\pi}$ (1)

(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.

Error interval $= \frac{0.1}{2}$

$= 0.05$

Upper interval $= 7.2 + 0.05$

$= 7.25$

Lower interval $= 7.2 - 0.05$

$= 7.15$

7.15 (1) $\leqslant p <$ 7.25 (1)

(Total for Question 27 is 2 marks)

---

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

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

$y = mx + c$ where m = gradient, c = y-intercept

$y = 3 - 4x$

$y = -4x + 3$ $\quad m = -4$

$c = 3$

Rearrange the equation to form $y = mx + c$

-4 (1)

(1)

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

when L crosses the y-axis,

$x = 0$

$y = 3 - 4(0)$

$= 3$

(0 , 3)

(1) (1)

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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