1. Nov/2020/Paper_11/No.3

   Write $\dfrac{60}{105}$ in its simplest form.

   .... [1]

2.

Calculate.

$$\sqrt{\frac{1}{0.01} - 8^2}$$

.... [1]

3.
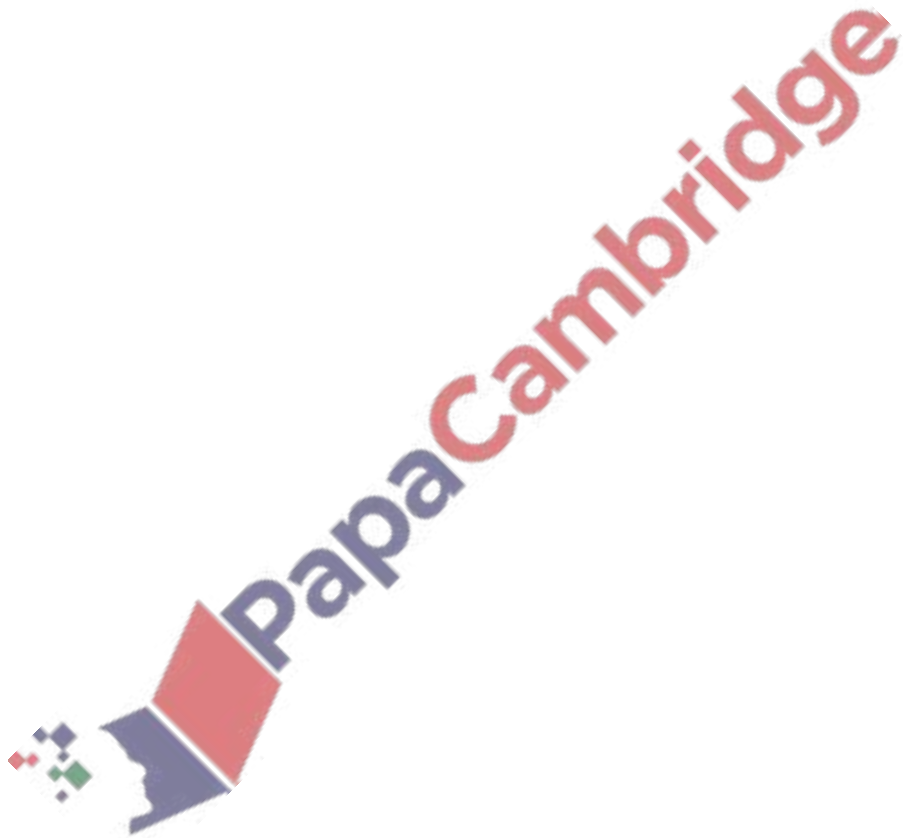
Alan and Beth share $1190 in the ratio   Alan : Beth = 5 : 2.

Work out how much Alan receives.

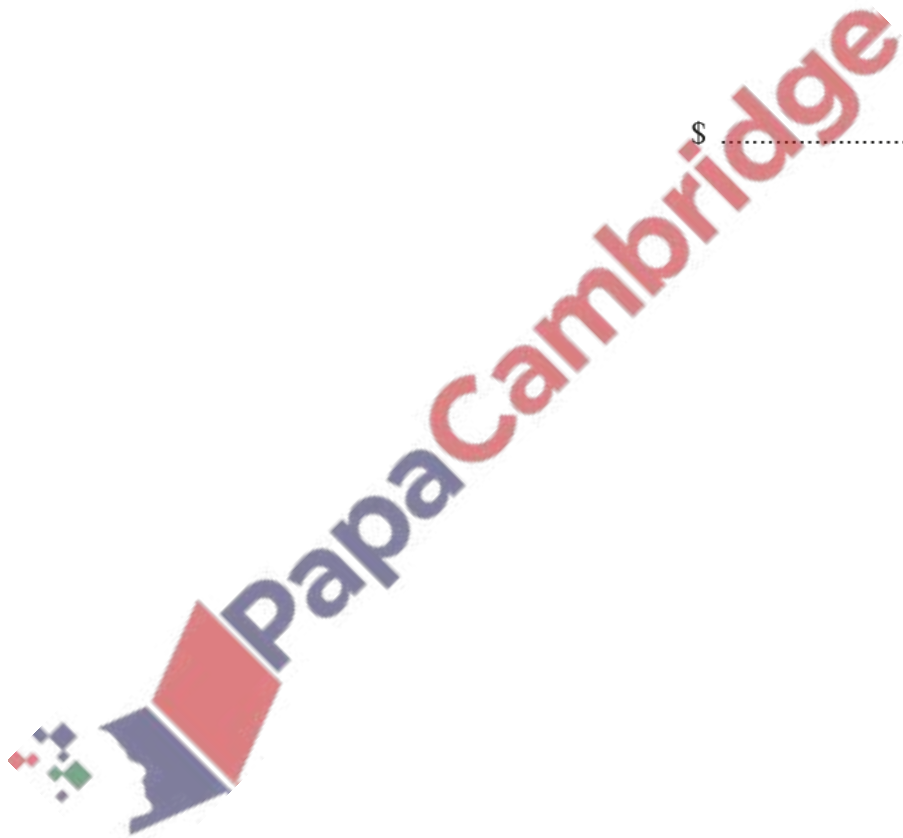$ .... [2]
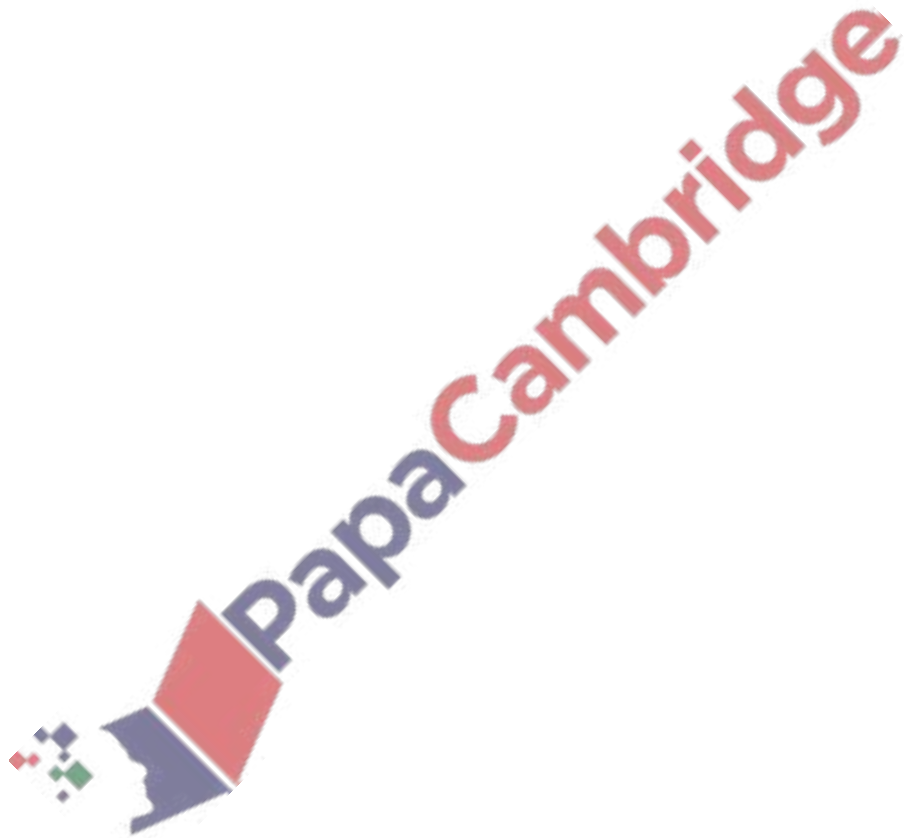
4.

Rangan buys 3.6 kg of potatoes and 2.8 kg of leeks.
The total cost is $13.72 .
Leeks cost $2.65 per kilogram.

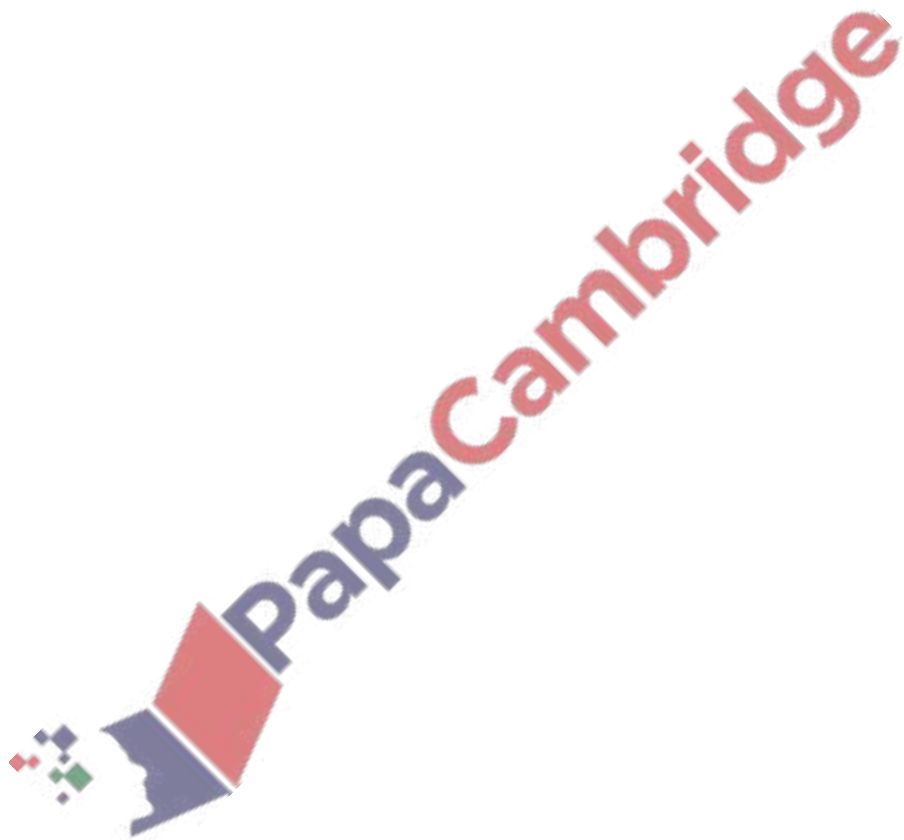Find the cost of 1 kg of potatoes.

$ .... [3]

5.

$$T = \frac{49.2 - 9.59}{4.085 \times 2.35}$$

By writing each number correct to 1 significant figure, work out an estimate for T.
You must show all your working.

.... [2]

6.

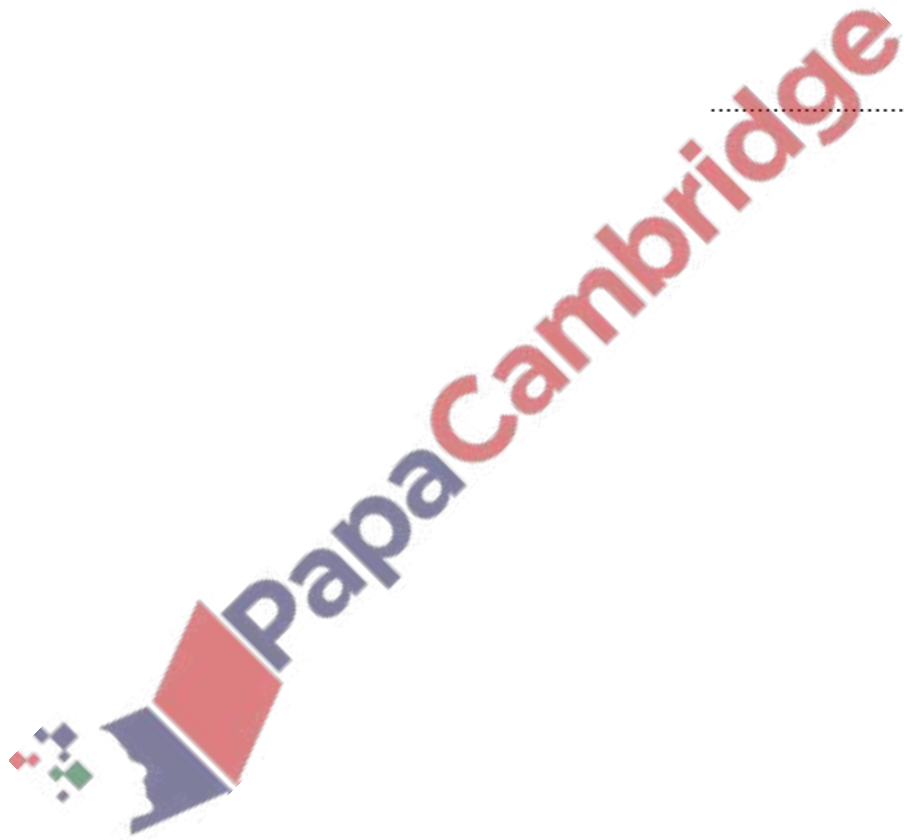**Without using a calculator**, work out $2\frac{2}{3} \times 2\frac{3}{4}$.

You must show all your working and give your answer as a mixed number in its simplest form.

.... [3]

7.

Change 4.37 litres into cubic centimetres.

.... cm^3 [1]

8.
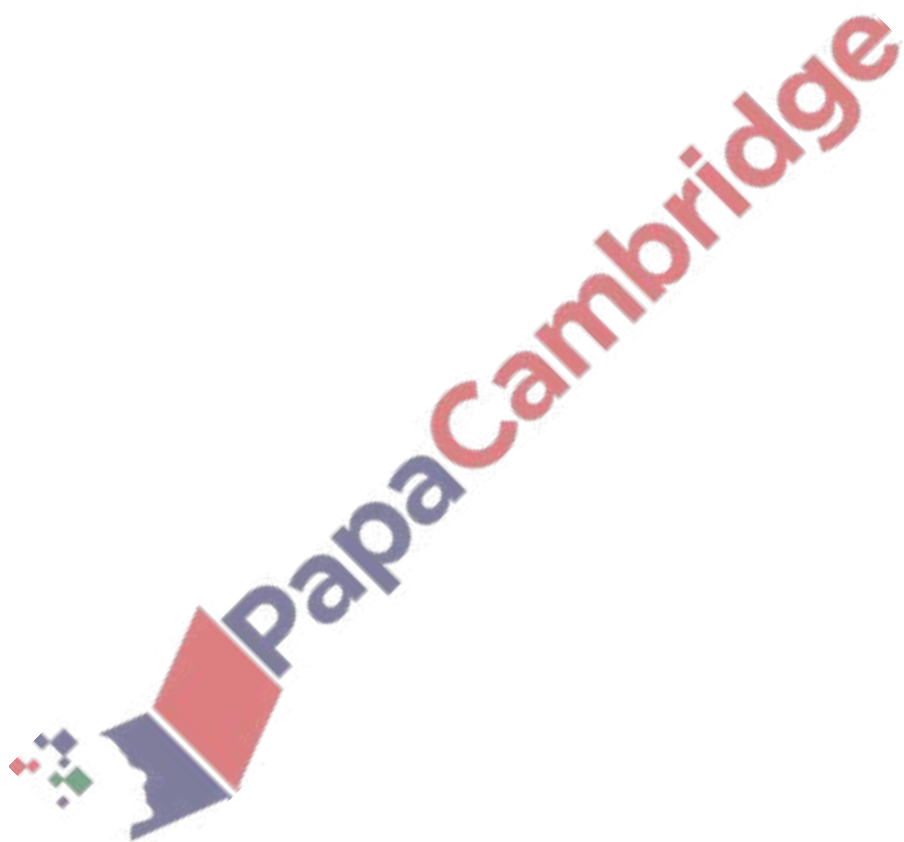
Trina invests $16 000 at a rate of 5% per year compound interest.

Work out the value of her investment at the end of 4 years.

$ .... [2]

9.
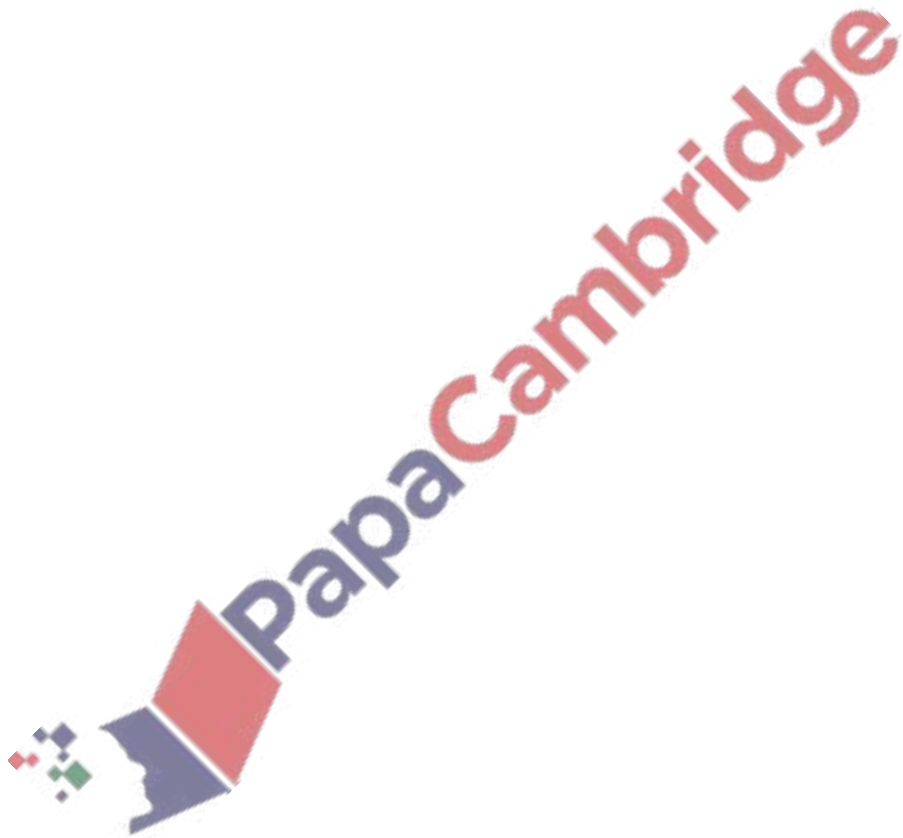
Write two hundred thousand and seventeen in figures.

.... [1]

10.
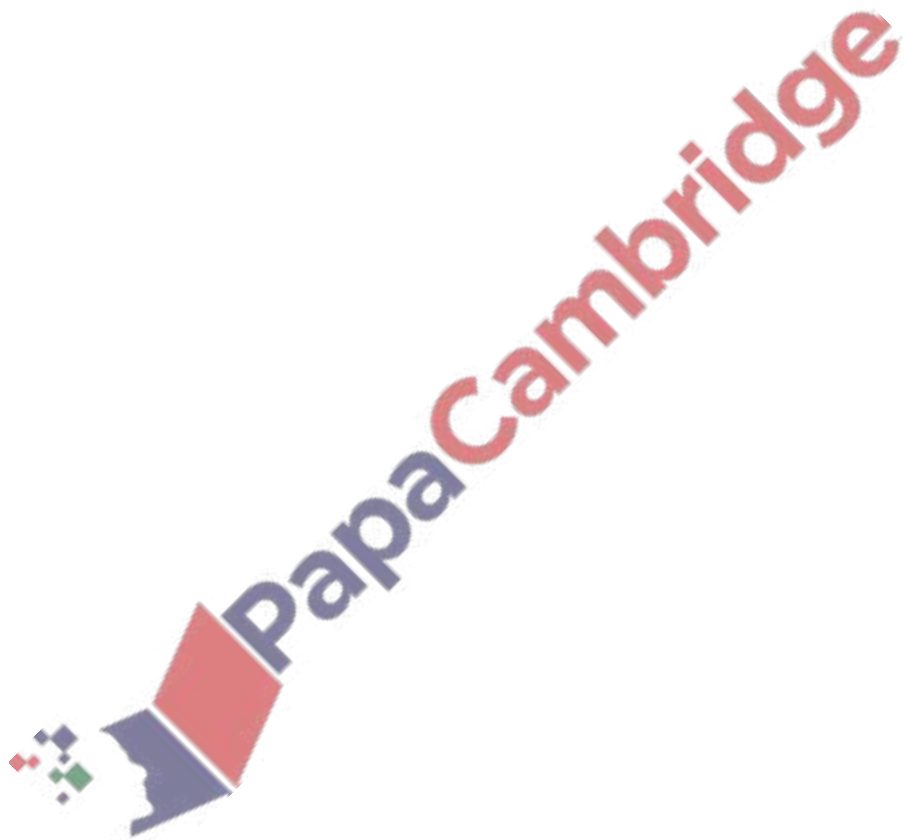
Write 867 correct to the nearest ten.

.... [1]

11.
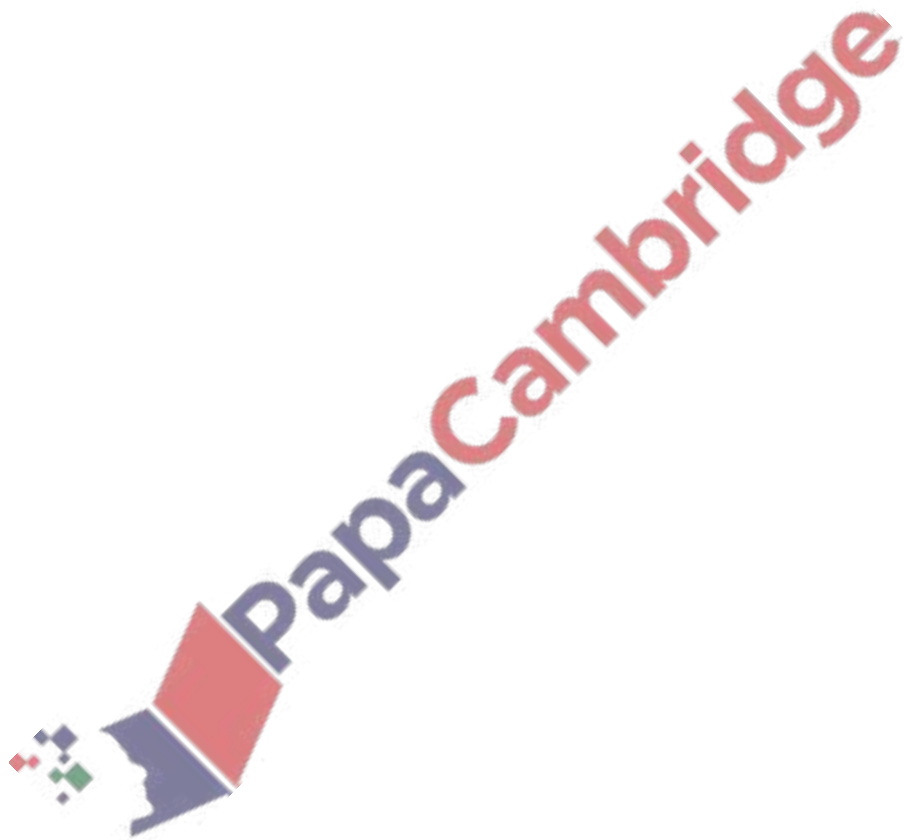
Work out the number of hours in 3 days.

.... hours [1]

12.
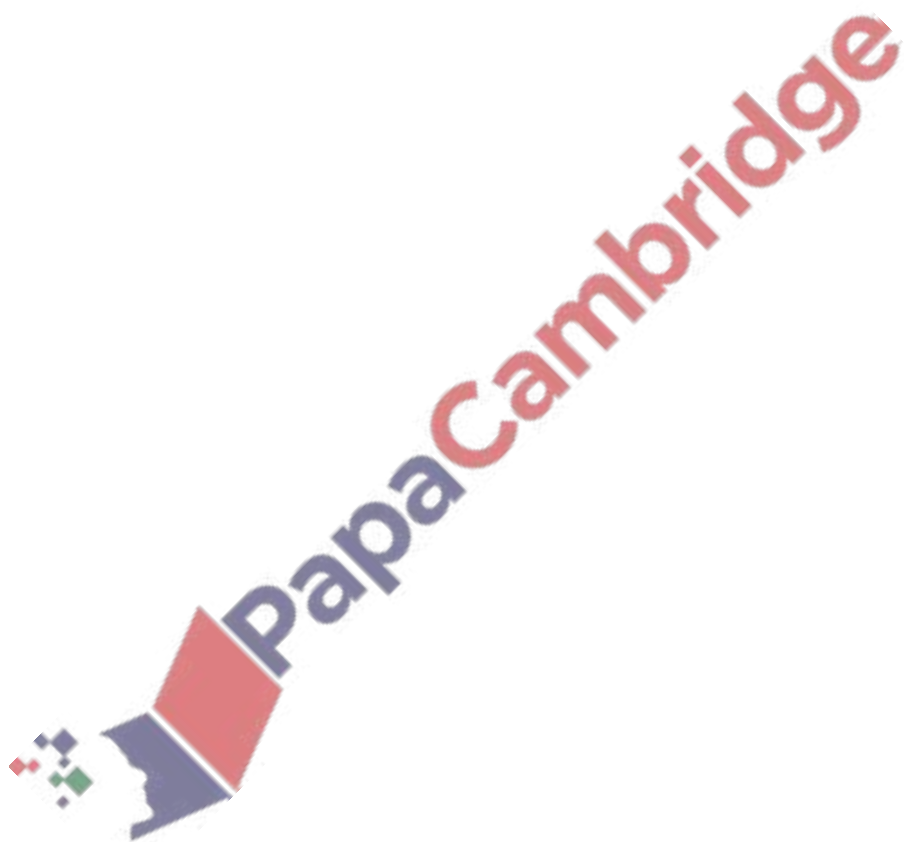
Write these in order of size, starting with the smallest.

$$\frac{11}{27} \qquad 41\% \qquad 0.4 \qquad \frac{16}{39}$$

.... < .... < .... < .... [2]

smallest

13.
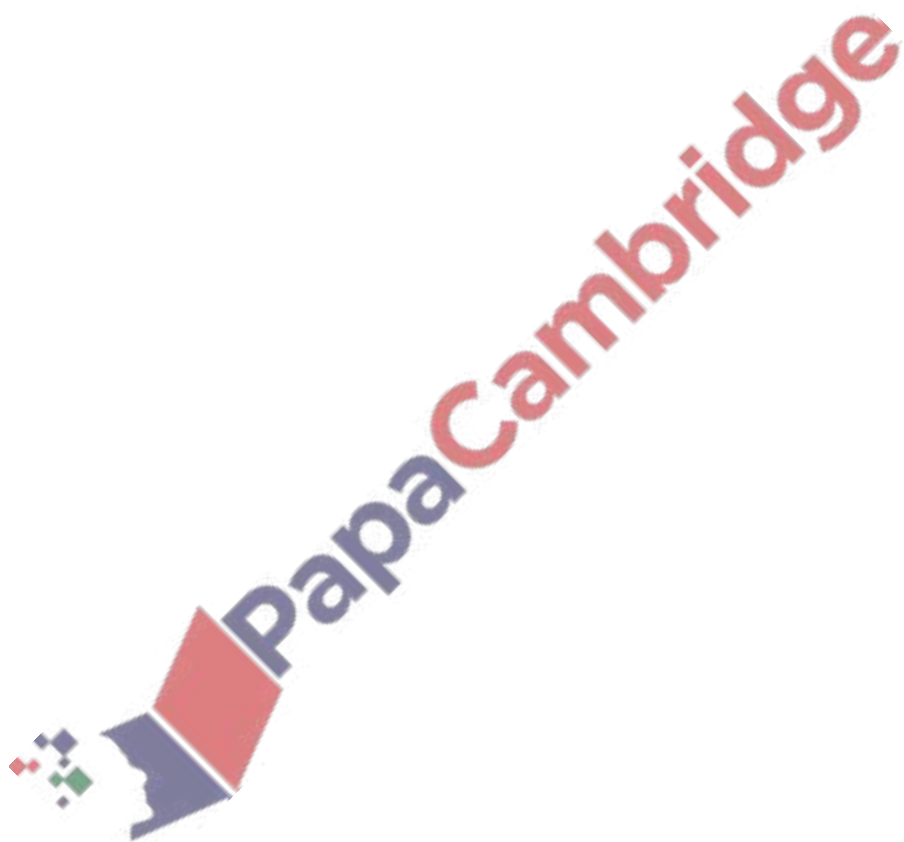
Work out the difference in temperature between $-6\,°C$ and $5\,°C$.

.... $°C$ [1]
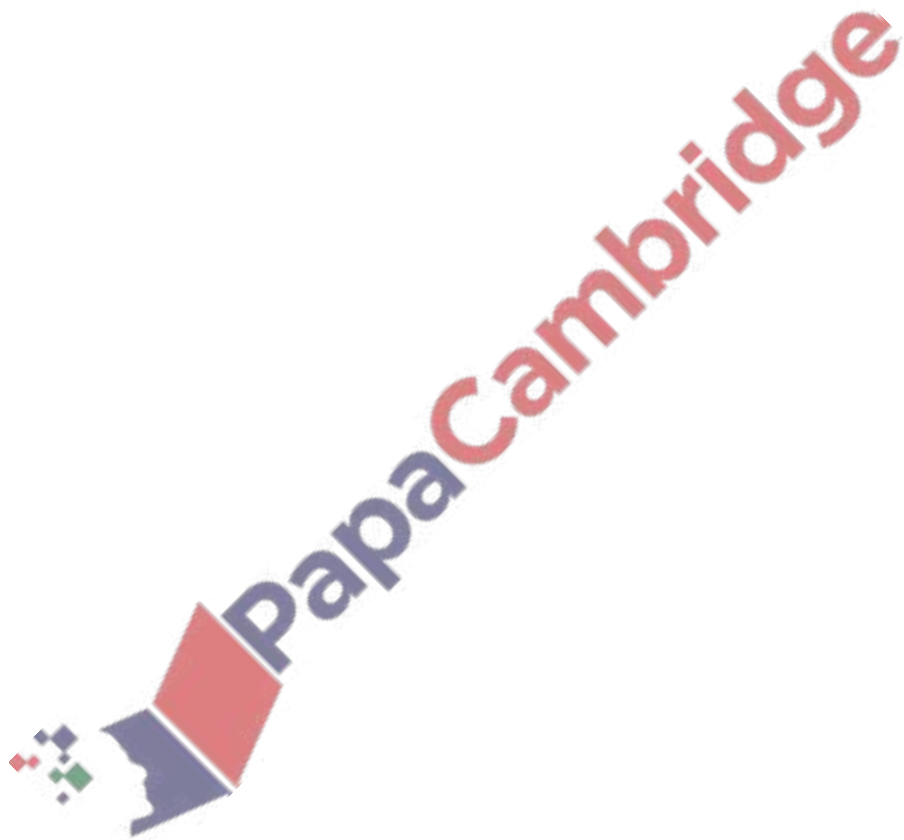
14.
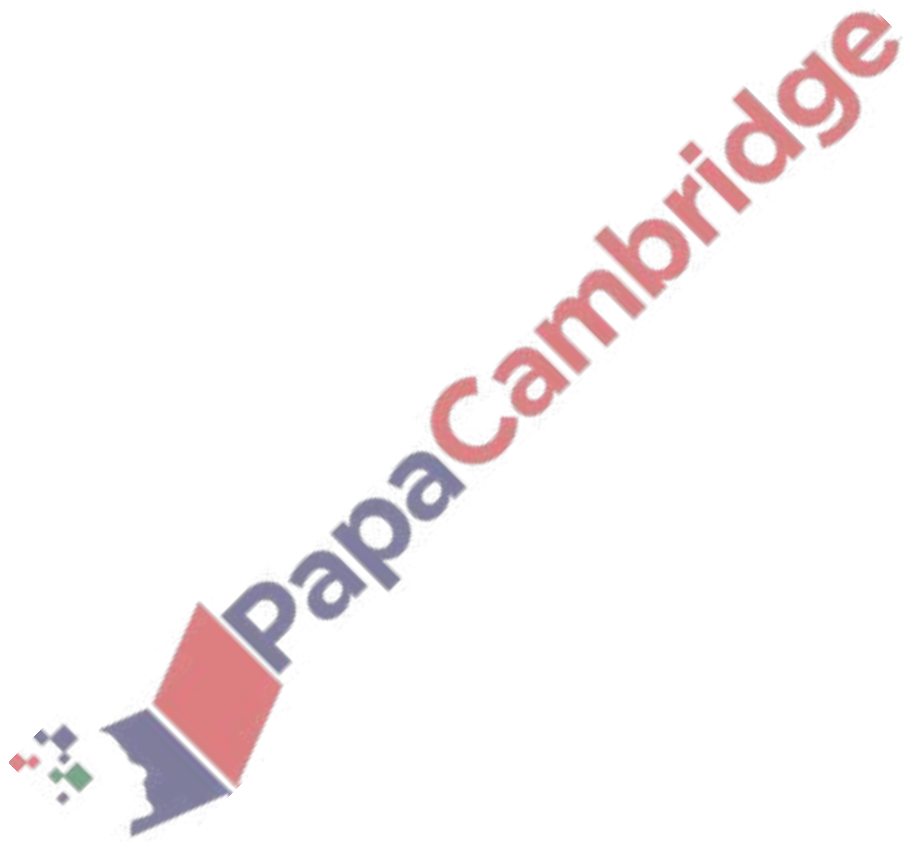
Increase 42 by 16%.

.... [2]

15.

Without using a calculator, work out $\dfrac{5}{6} \div 1\dfrac{1}{3}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]
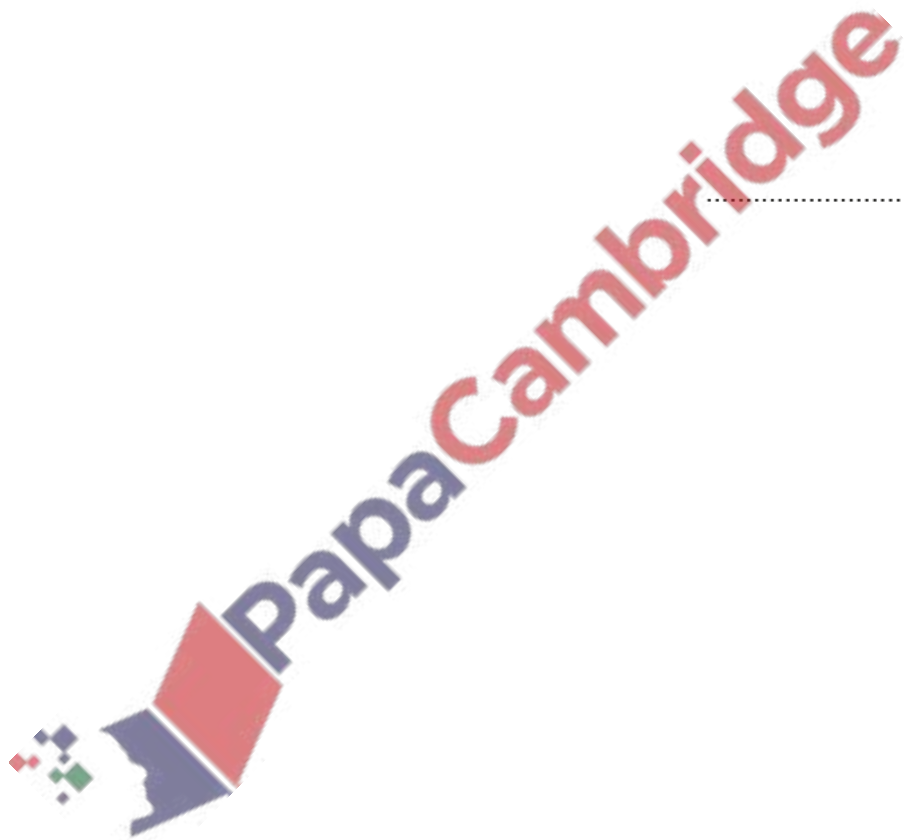
(a) The length, l cm, of a pencil is 18 cm, correct to the nearest centimetre.

Complete the statement about the value of l.

.... $\leqslant l <$ .... [2]

(b) (i) Write 9.314×10^5 as an ordinary number.

.... [1]

(ii) Calculate $(4.1 \times 10^{-3}) \times (8.9 \times 10^7)$.
Give your answer in standard form.

.... [2]

(c) Calculate $\sqrt{(8 + 4 \times 75^{0.6})}$.

.... [1]

16
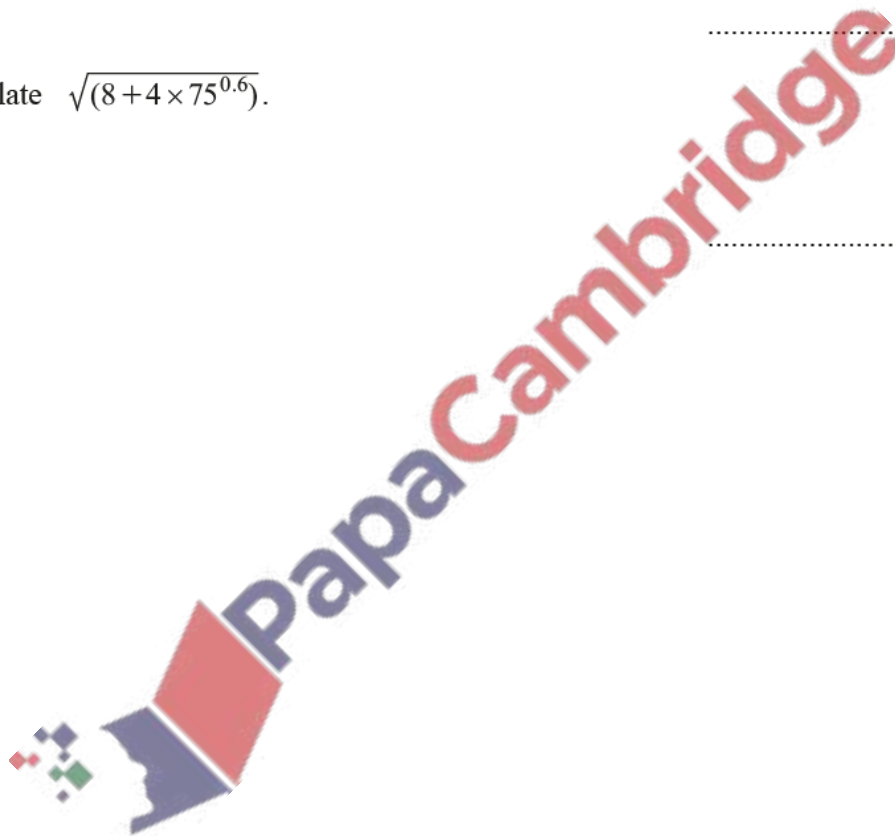
The length of one side of a rectangle is 12 cm.
The length of the diagonal of the rectangle is 13 cm.

Calculate the area of the rectangle.

.... cm^2 [3]
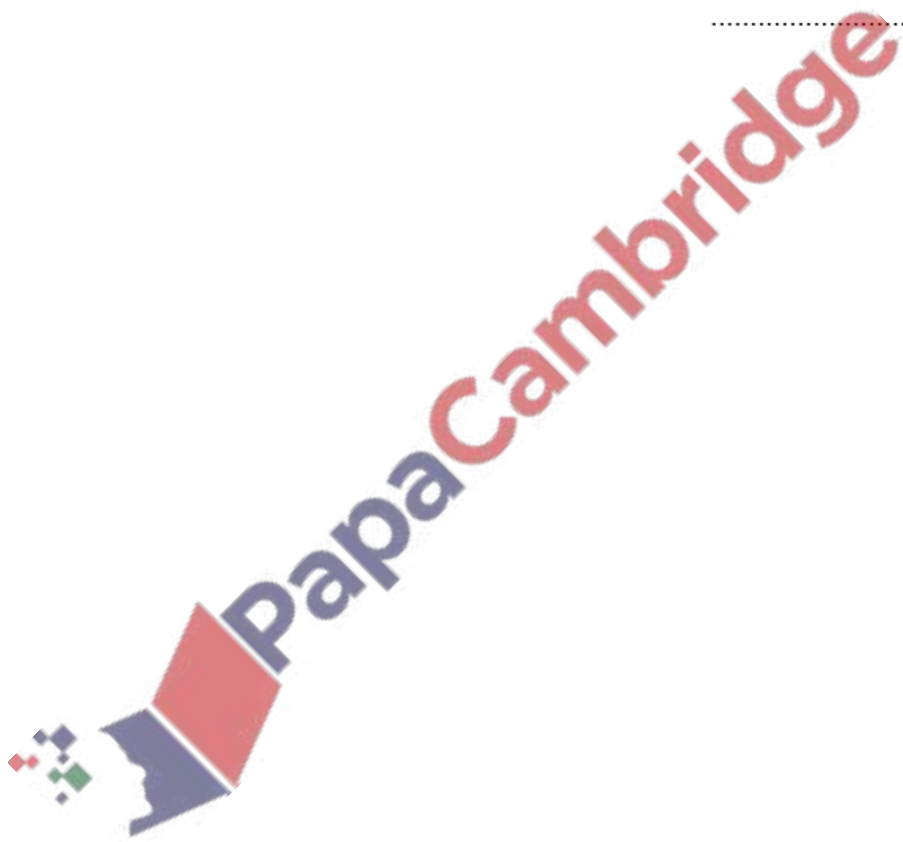
18.

Alex and Chris share sweets in the ratio   Alex : Chris = 7 : 3.
Alex receives 20 more sweets than Chris.

Work out the number of sweets Chris receives.

.... [2]

19.
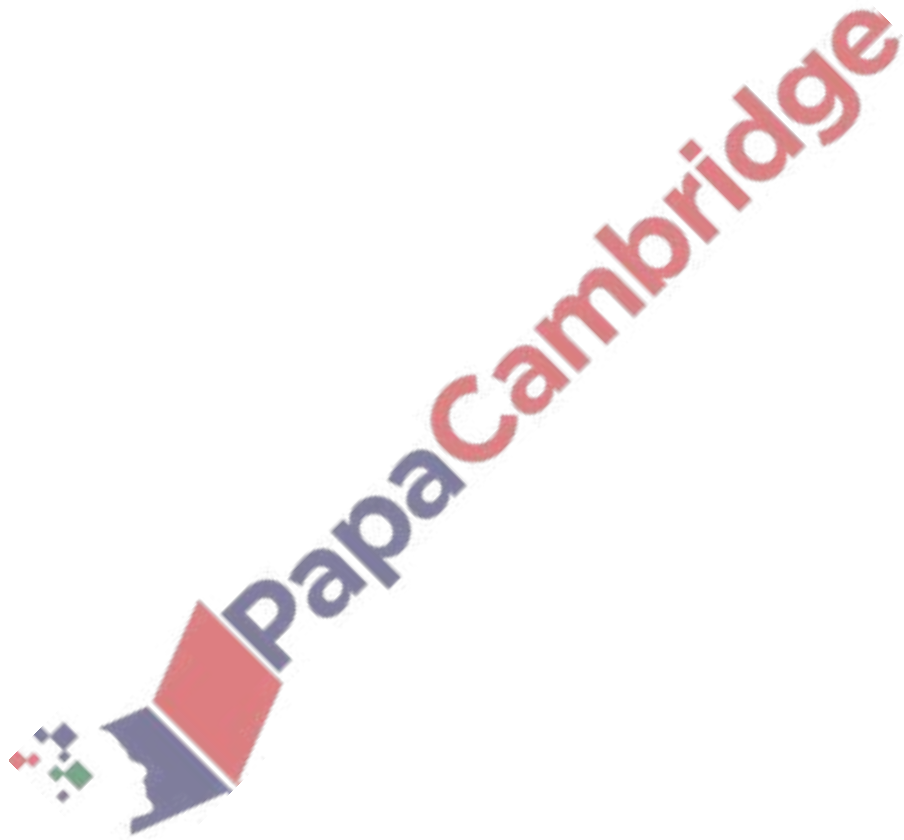
Write 825 as the product of its prime factors.

.... [2]

20.
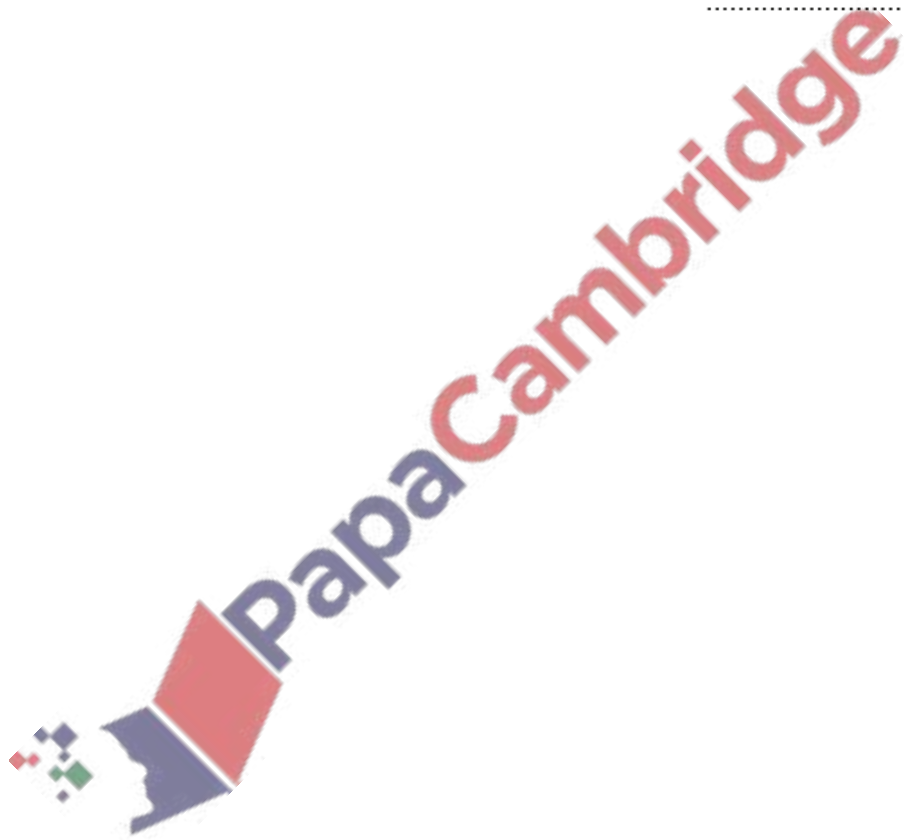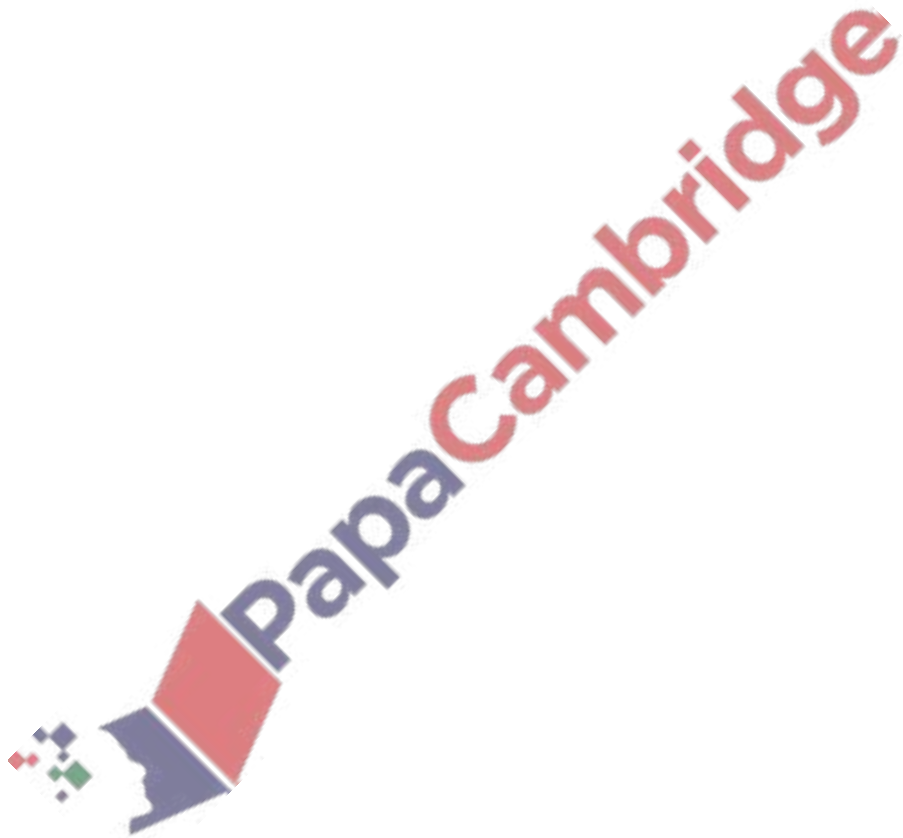
Complete this bill.

2.5 kg potatoes at $1.12 per kg	$ ....
.... kg bananas at $1.05 per kg	$ ....
Total =	$ 4.69

[3]

20

21.
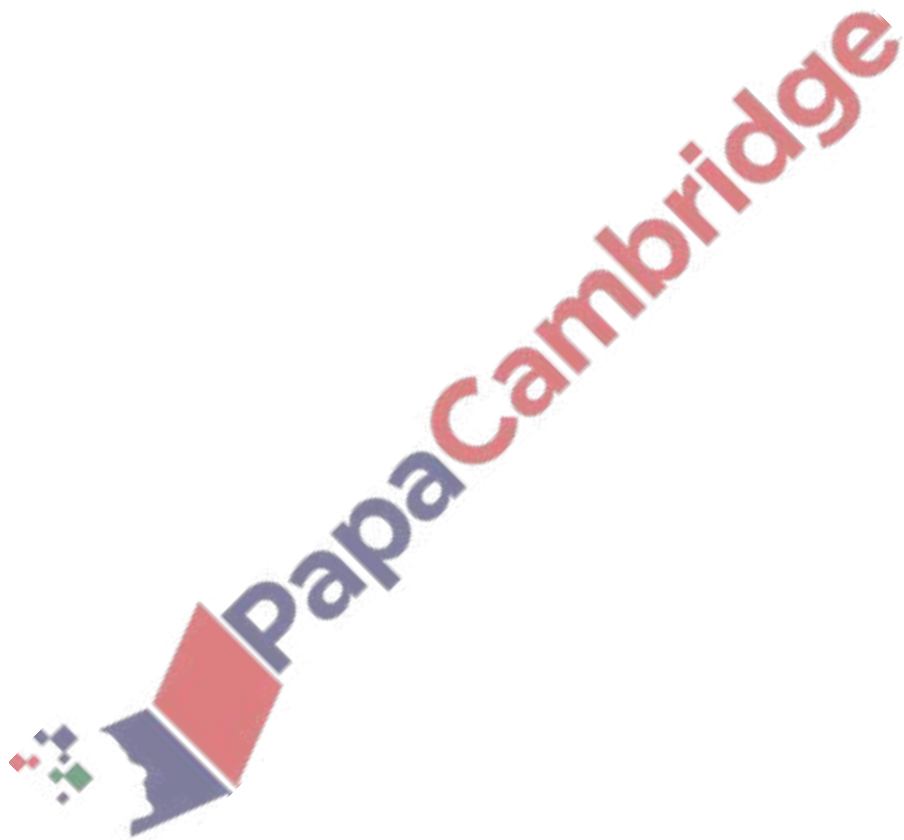
   (a) Write 97.4236 correct to 3 decimal places.

   .... [1]

   (b) Write down the reciprocal of 2.

   .... [1]

22. Nov/2020/Paper_13/No.7

(a) This table shows the temperature, in °C, at midnight and at 3 pm for four cities on the same day.

City	Temperature at midnight (°C)	Temperature at 3 pm (°C)
Sydney	21	28
Oslo	−3	1
Toronto	−18	−8
Seoul	−5	4

Use the table to complete this statement.

The city with the biggest difference in temperature between midnight and 3 pm

is .... with a difference of ....°C. [2]

(b) The temperature at midnight in Moscow was −11 °C.
At 3 pm the temperature has increased by 5 °C.

Work out the temperature at 3 pm.

.... °C [1]
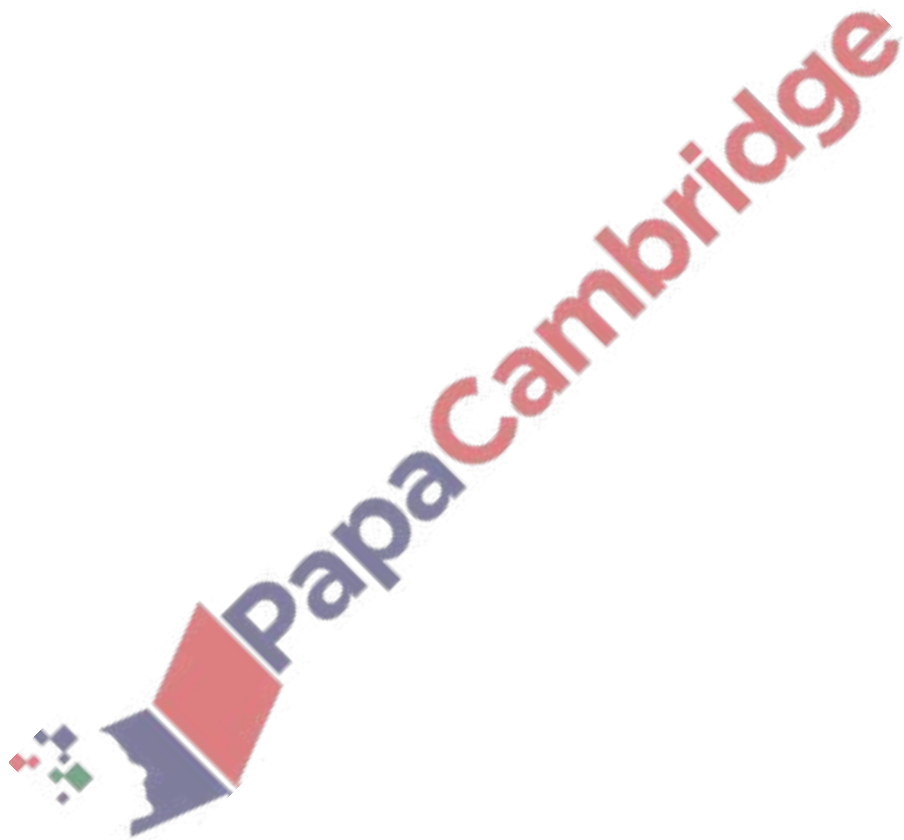
23.

Calculate.

$$\frac{4}{\sqrt{0.0025}}$$

.... [1]

24.

Thor changes 40 000 Icelandic Krona into dollars when the exchange rate is 1 krona = $0.0099 .

Work out how many dollars he receives.

$ .... [1]

25.
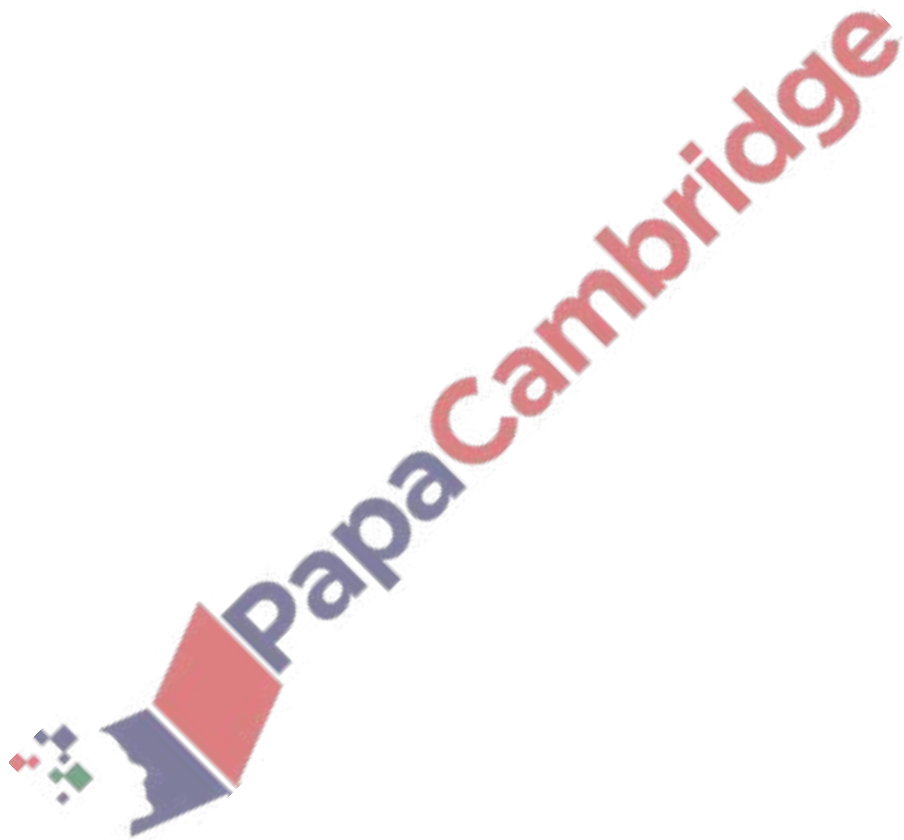
Ethan invests $6400 at a rate of 2.6% per year simple interest.

Calculate the total value of his investment at the end of 3 years.

$ .... [3]
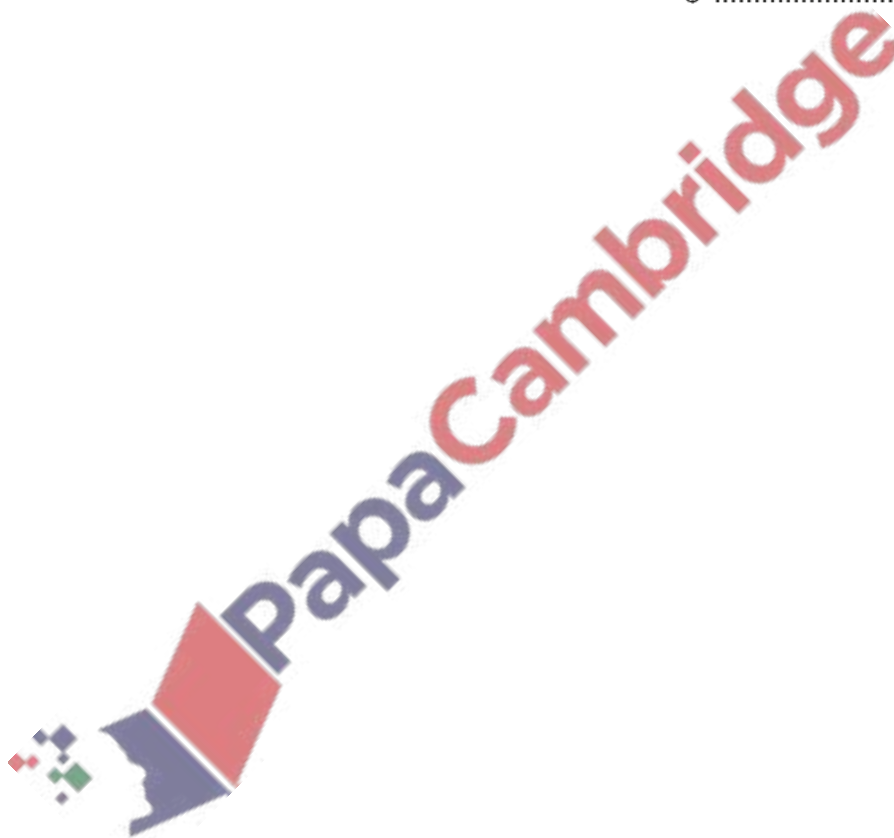
26.

The length, l cm, of a line is 18.3 cm, correct to the nearest millimetre.

Complete this statement about the value of l.

.... $\leqslant l <$ .... [2]

27.
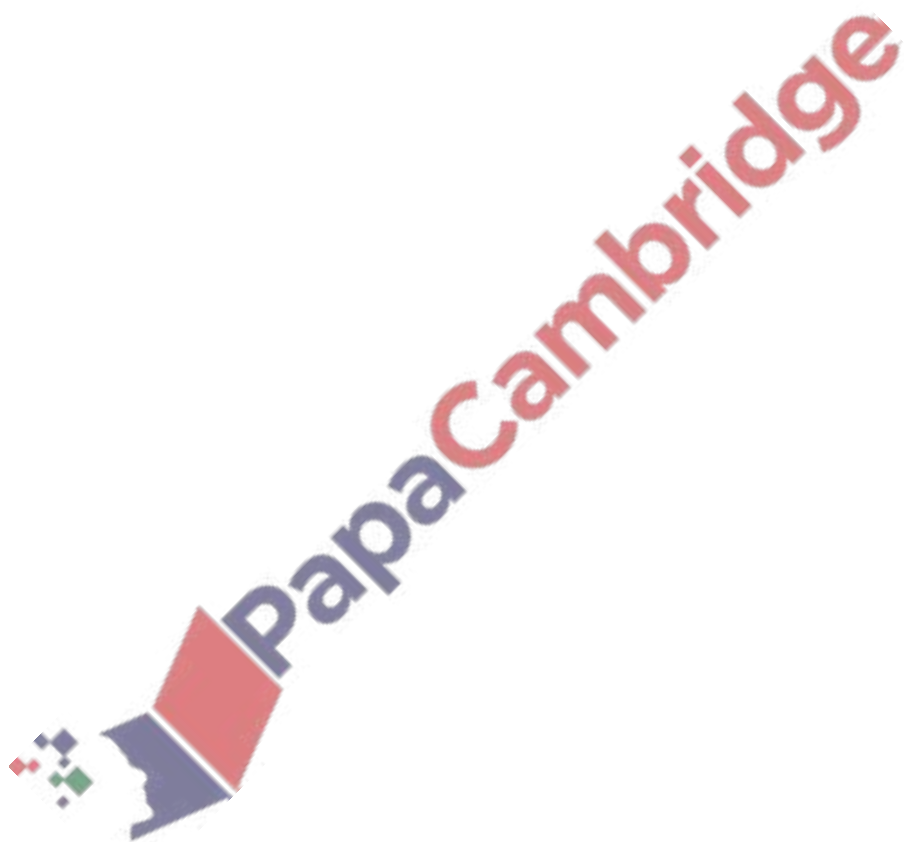
By writing each number correct to 1 significant figure, estimate the value of

$$\frac{37.8 \times 13.2}{28.5 + 22.1}.$$

You must show all your working.

.... [2]
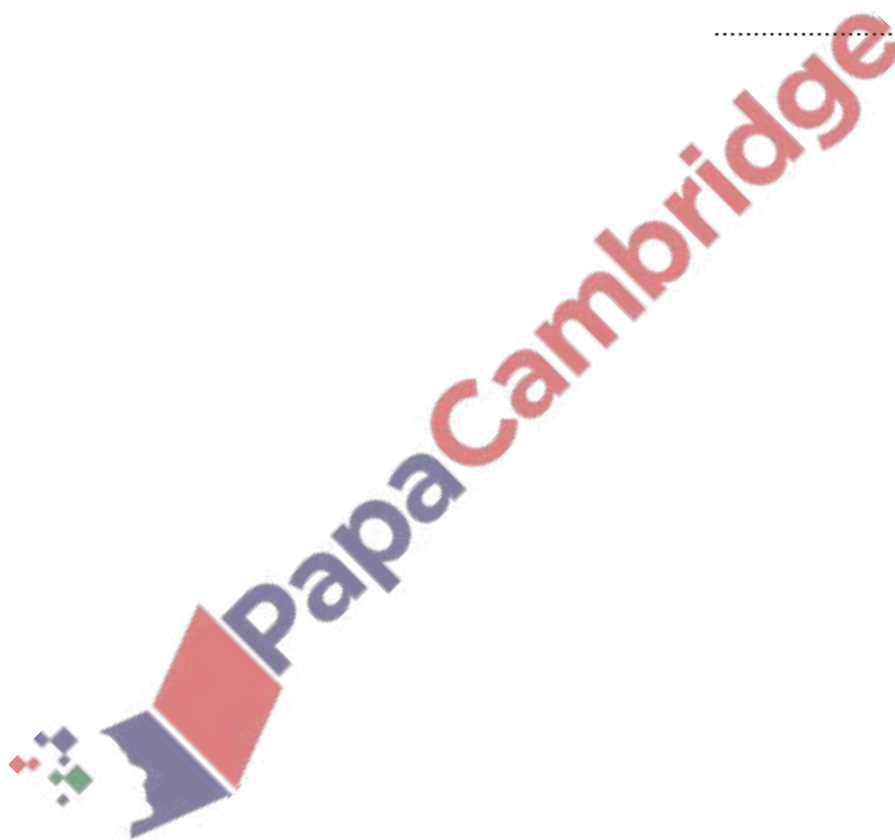
A bag contains 7 red discs, 5 green discs and 2 pink discs.

Helen takes one disc at random, records the colour and replaces it in the bag.
She does this 140 times.

Find how many times she expects to take a green disc.

.... [2]
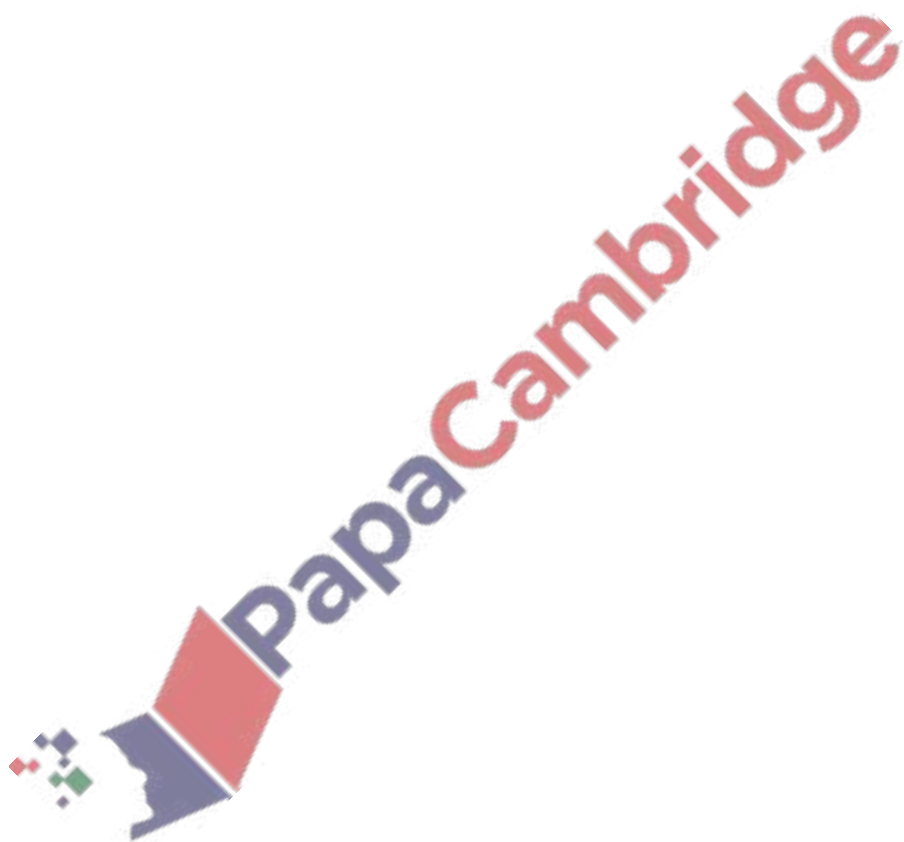
Ramond walks 2460 metres in 33 minutes.

Work out Ramond's average speed in kilometres per hour.

.... km/h [3]
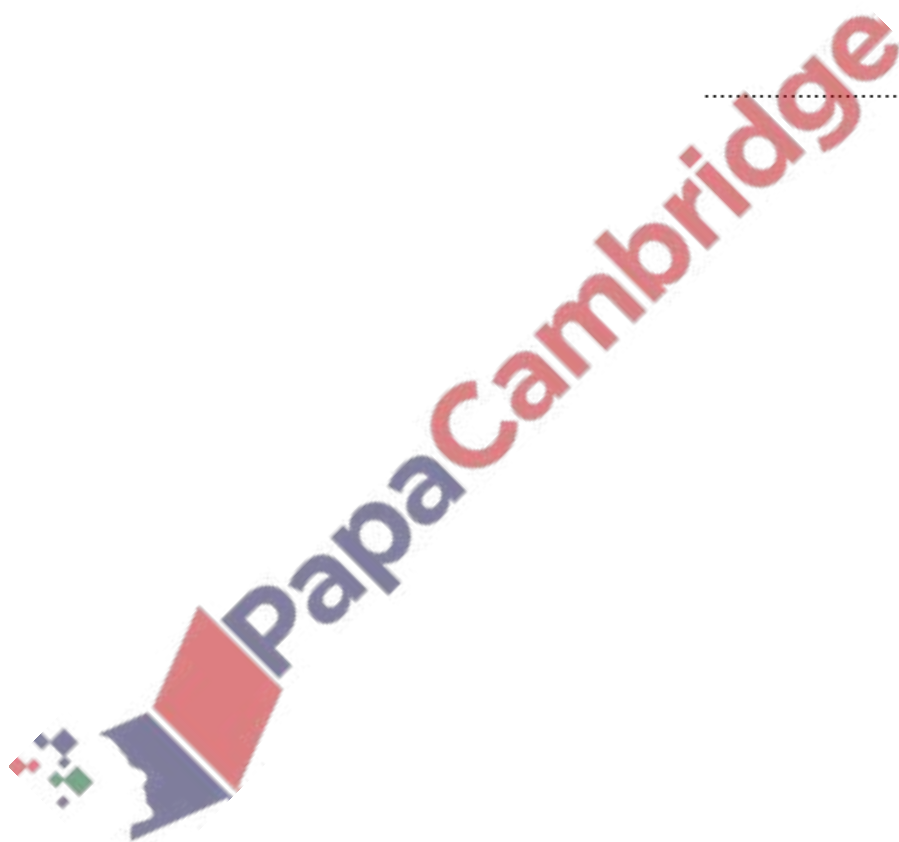
Without using a calculator, work out $1\frac{1}{7} \times 2\frac{1}{10}$.

You must show all your working and give your answer as a mixed number in its simplest form.

.... [3]

31.
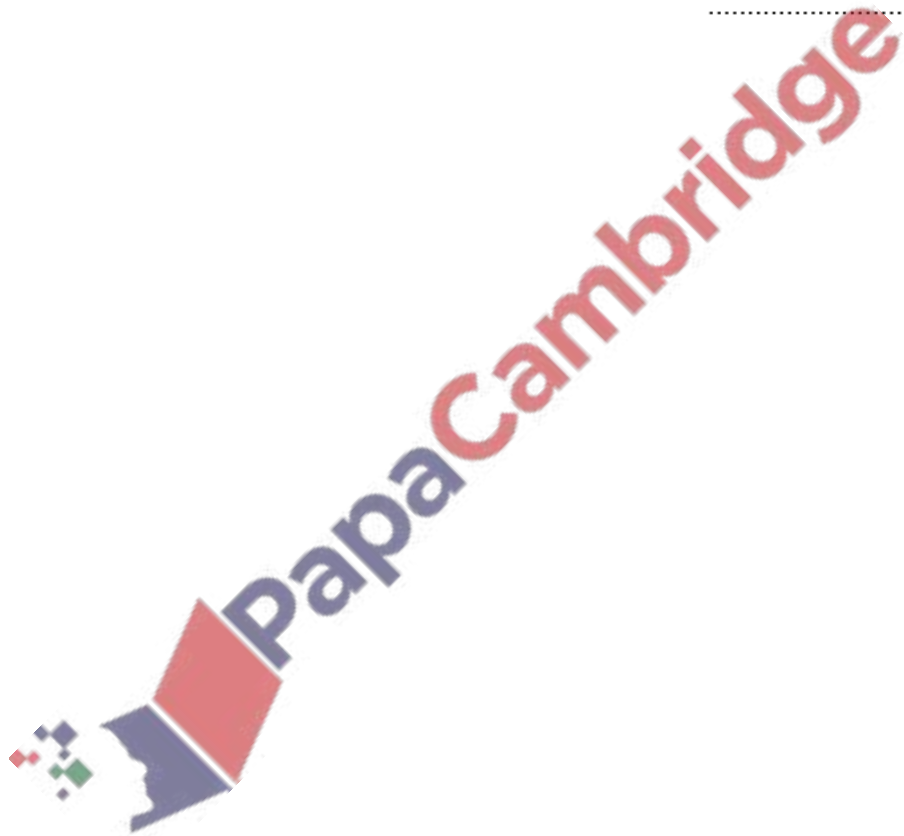
$\mathscr{E}$ = {children in a group}
R = {children who own a rabbit}
H = {children who own a hamster}

There are 40 children in the group.
19 children own a rabbit.
27 children own a hamster.

(a) Complete the Venn diagram.

[2]

(b) Write down $n(R \cap H)$.

.... [1]
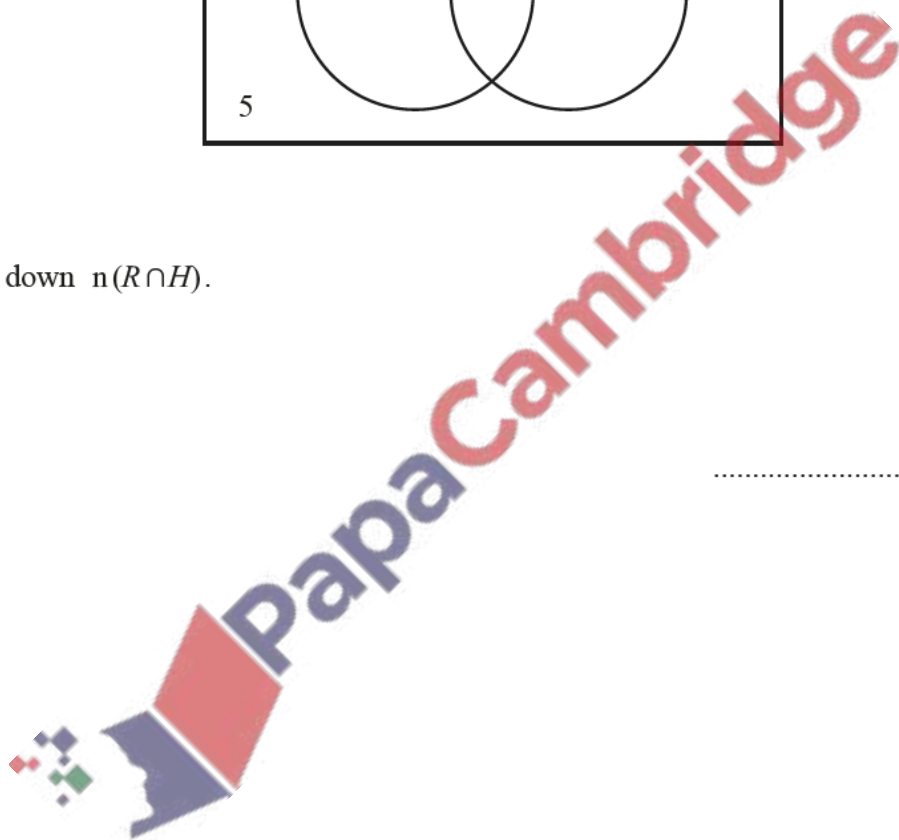
32.

Rangan buys 3.6 kg of potatoes and 2.8 kg of leeks.
The total cost is $13.72 .
Leeks cost $2.65 per kilogram.

Find the cost of 1 kg of potatoes.

$ .... [3]

$$T = \frac{49.2 - 9.59}{4.085 \times 2.35}$$

By writing each number correct to 1 significant figure, work out an estimate for T.
You must show all your working.

.... [2]

34.
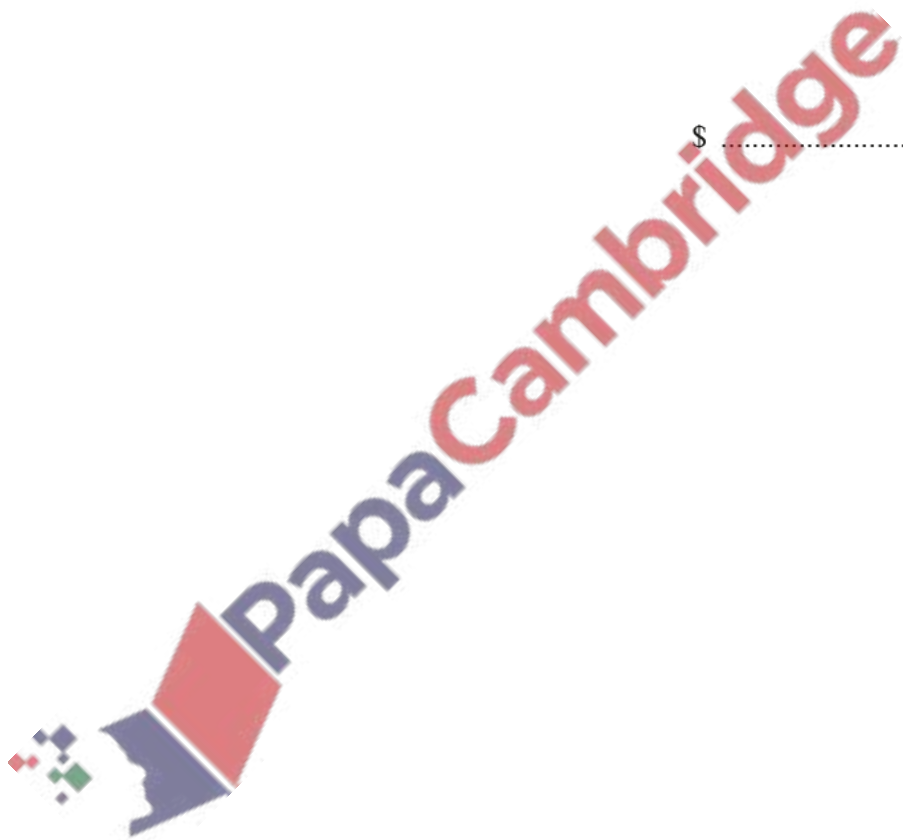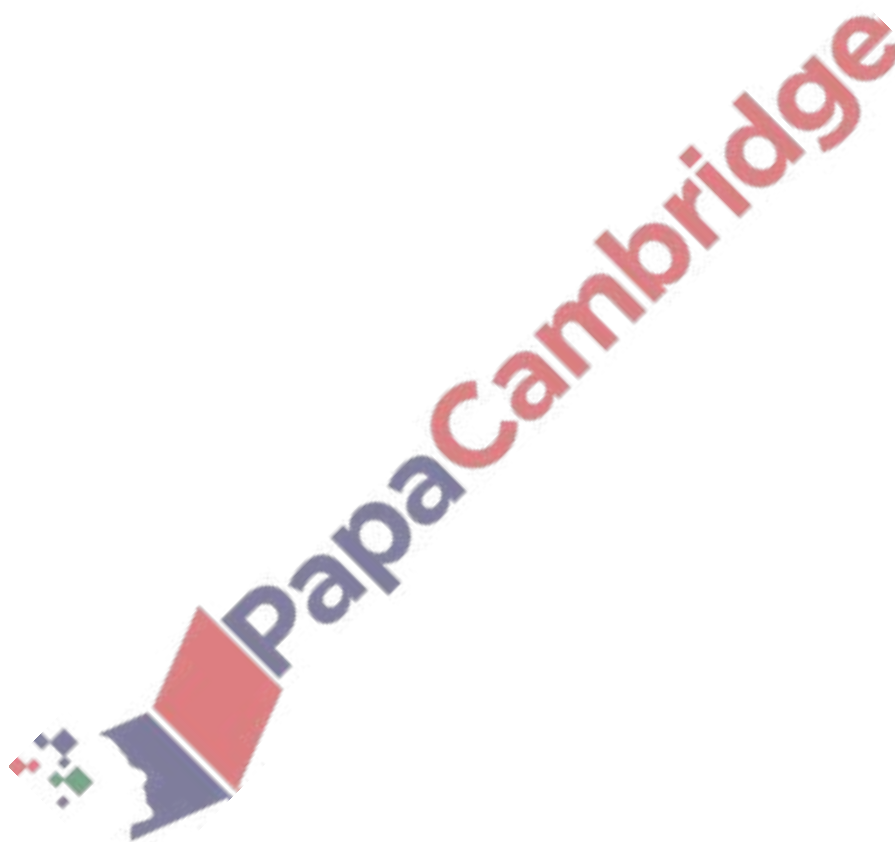
Without using a calculator, work out $2\frac{2}{3} \times 2\frac{3}{4}$.

You must show all your working and give your answer as a mixed number in its simplest form.

.... [3]

35.
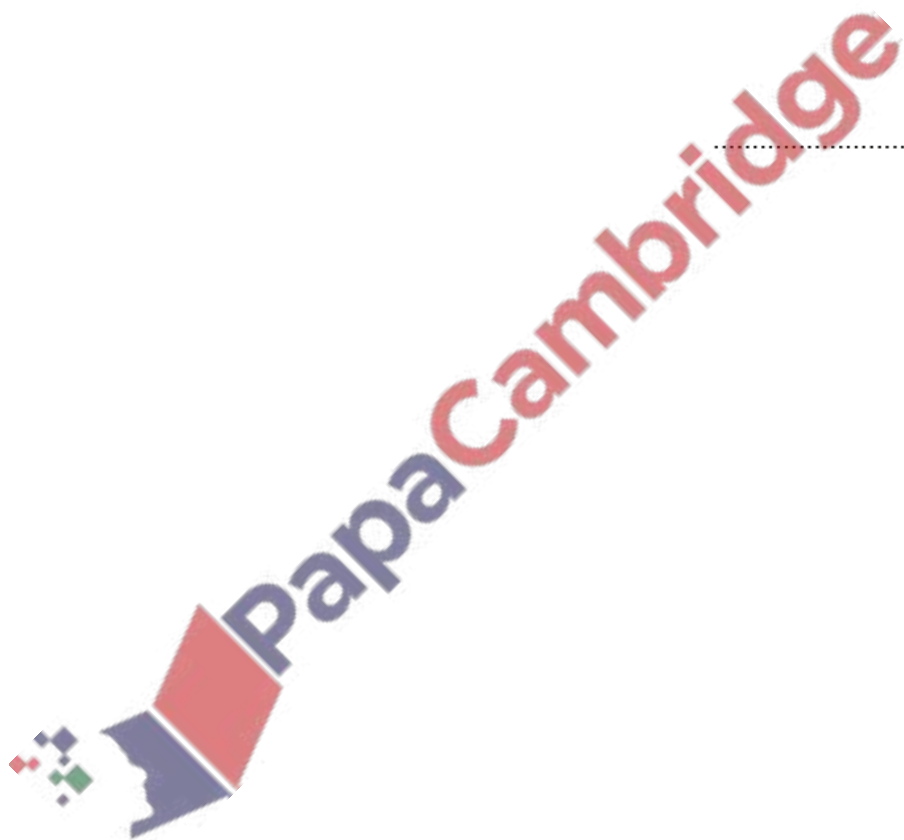
    (a) 1, 2, 3, 5 and 7 are all common factors of two numbers.

       Write down the digit that the two numbers must end in.

       .... [1]

    (b) Write 84 as a product of its prime factors.

       .... [2]
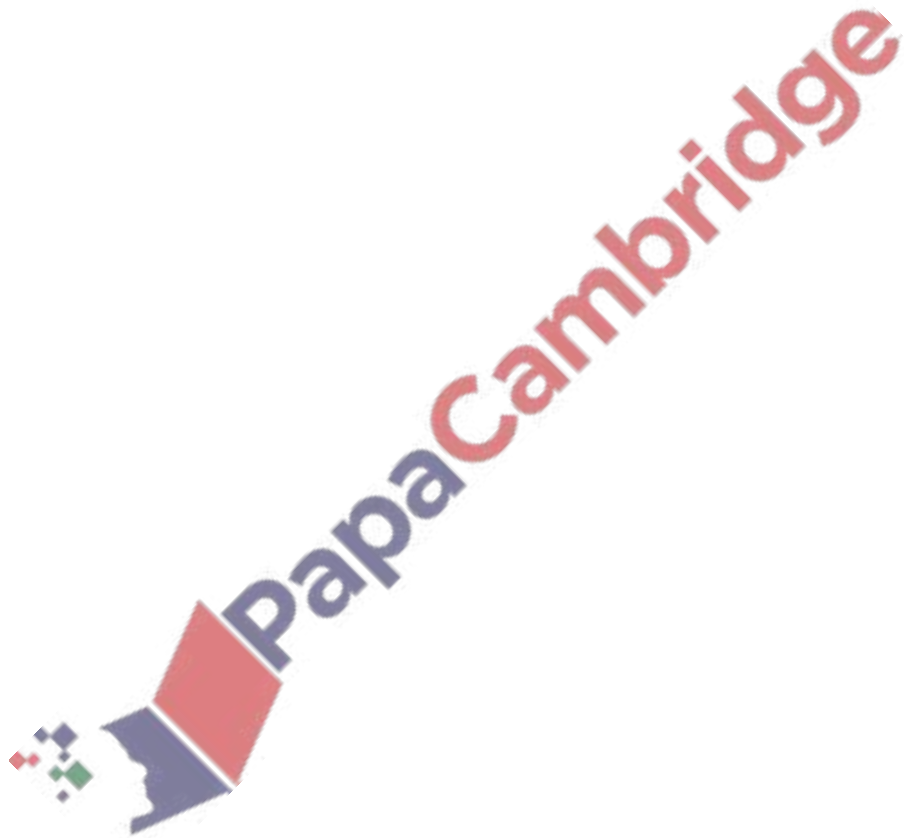
(a) Ahmed increases 40 by 300%.

From this list, put a ring around the correct calculation.

$$40 \times 1.300 \qquad 40 \times 3 \qquad 40 \times 400 \qquad 40 \times 4 \qquad 40 \times 300$$

[1]

(b) Ahmed finds the magnitude of the vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$.

From this list, put a ring around the correct calculation.

$$\sqrt{2^2 + -3^2} \qquad 2^2 - 3^2 \qquad \sqrt{2^2 - 3^2} \qquad 2^2 + (-3)^2 \qquad \sqrt{2^2 + (-3)^2}$$

[1]
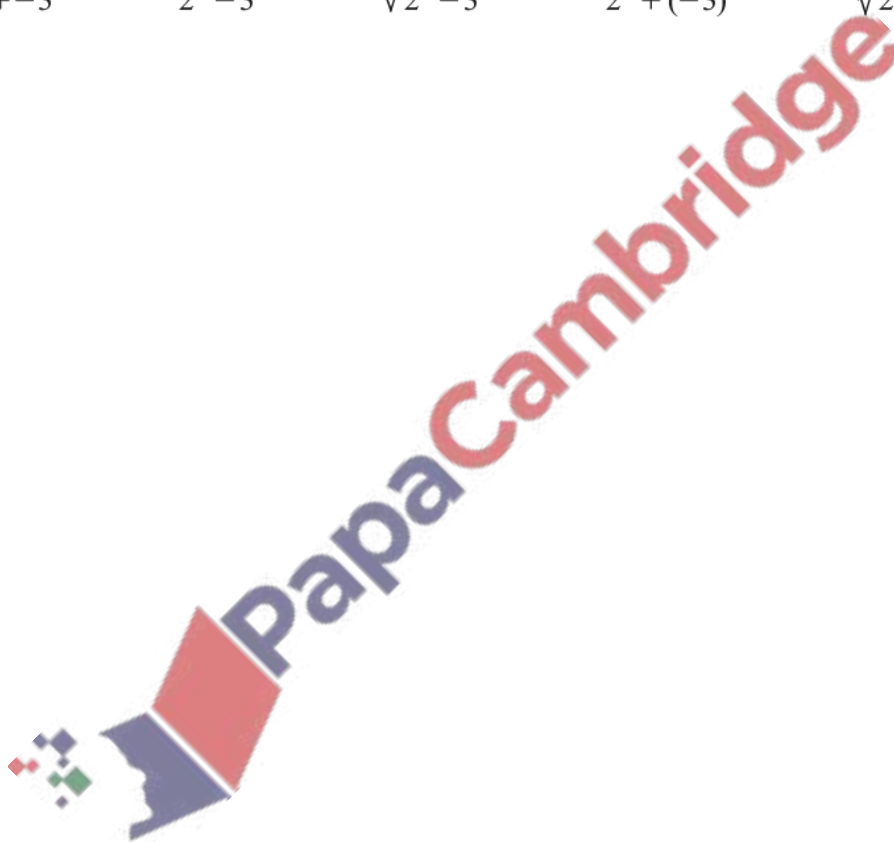
A town has a population of 45 000.
This population increases exponentially at a rate of 1.6% per year.

Find the population of the town at the end of 5 years.
Give your answer correct to the nearest hundred.

.... [3]

38.
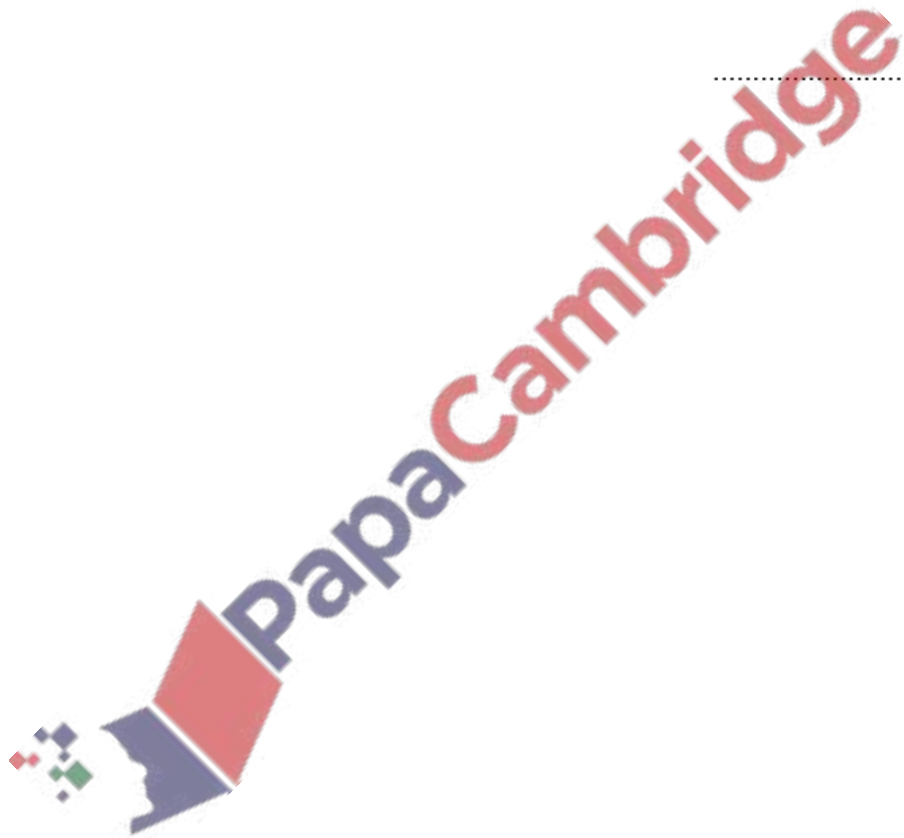
Write the recurring decimal $0.1\dot{7}$ as a fraction in its simplest form.
You must show all your working.

.... [3]
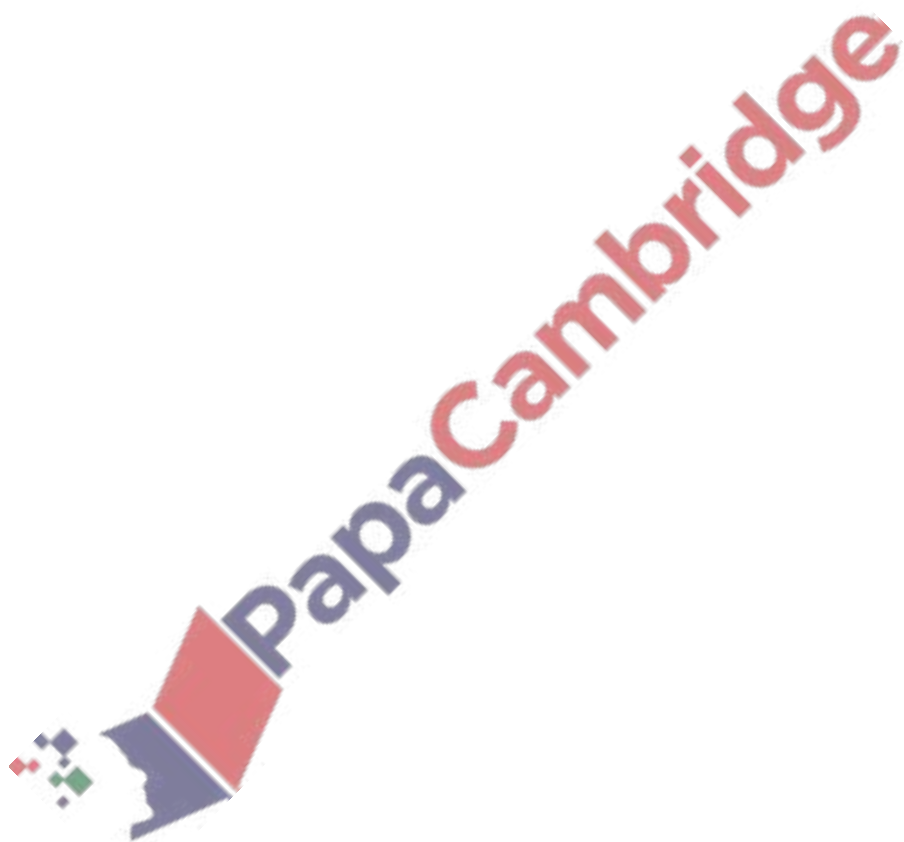
In this Venn diagram, shade the region $M' \cup N \cup P$.
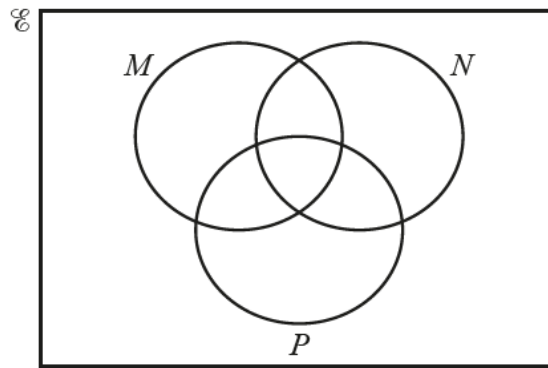
[1]

40.

Write two hundred thousand and seventeen in figures.

.... [1]
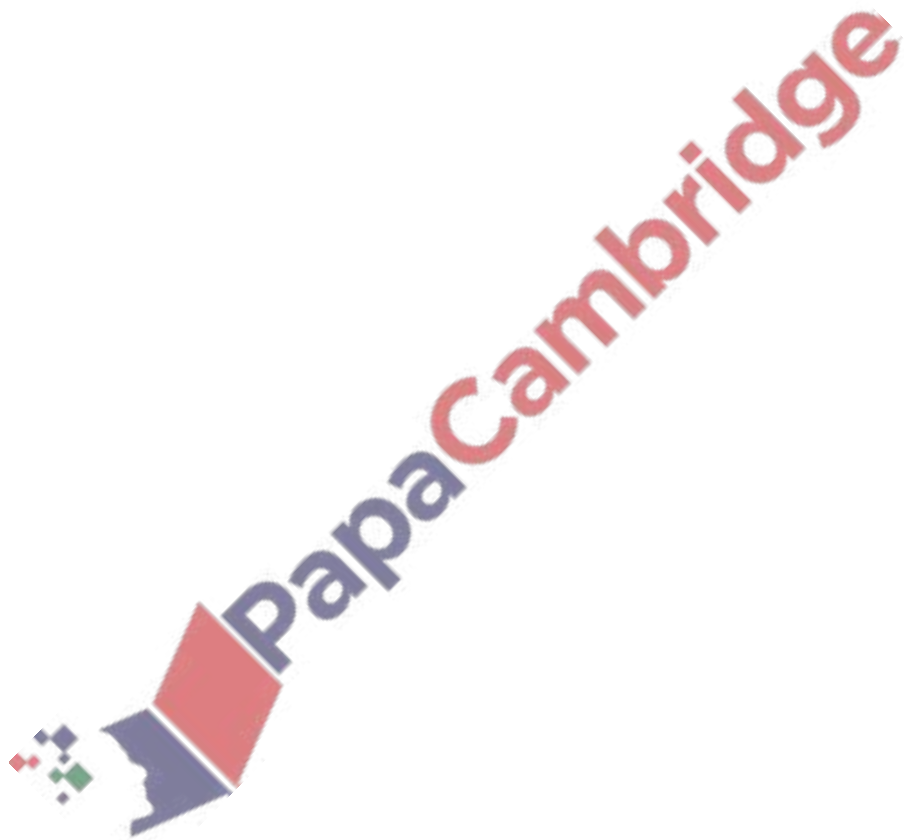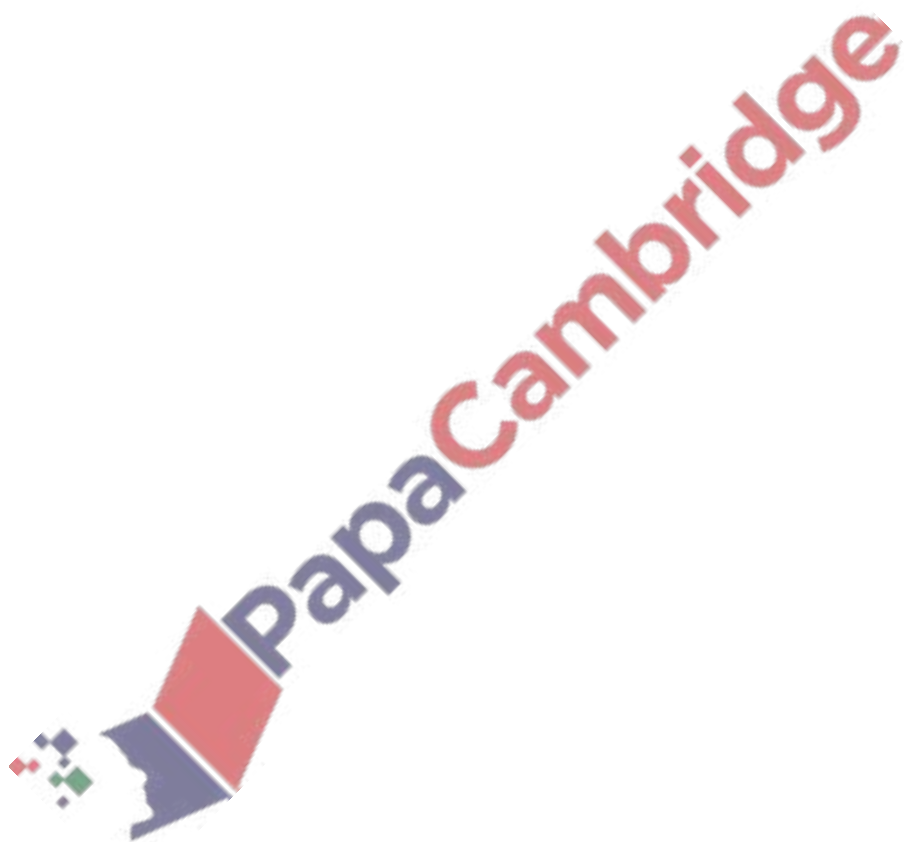
Insert one pair of brackets to make this calculation correct.

$$7 - 5 - 3 + 4 = 9$$

[1]

42.
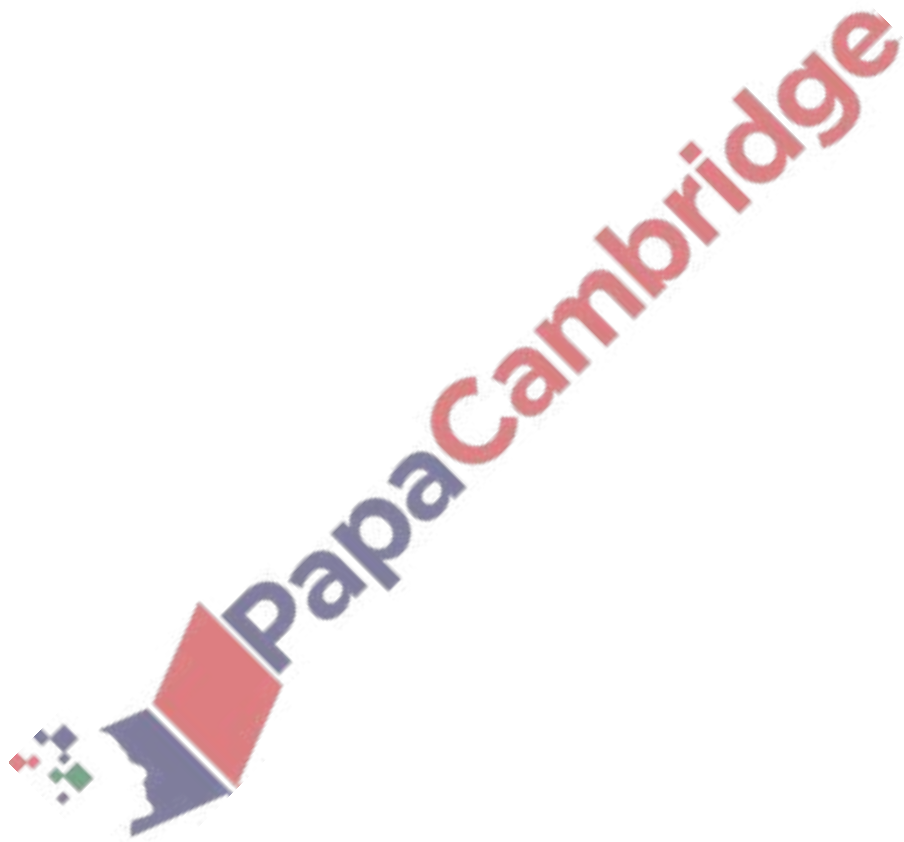
Increase 42 by 16%.

.... [2]

Without using a calculator, work out $\dfrac{5}{6} \div 1\dfrac{1}{3}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]
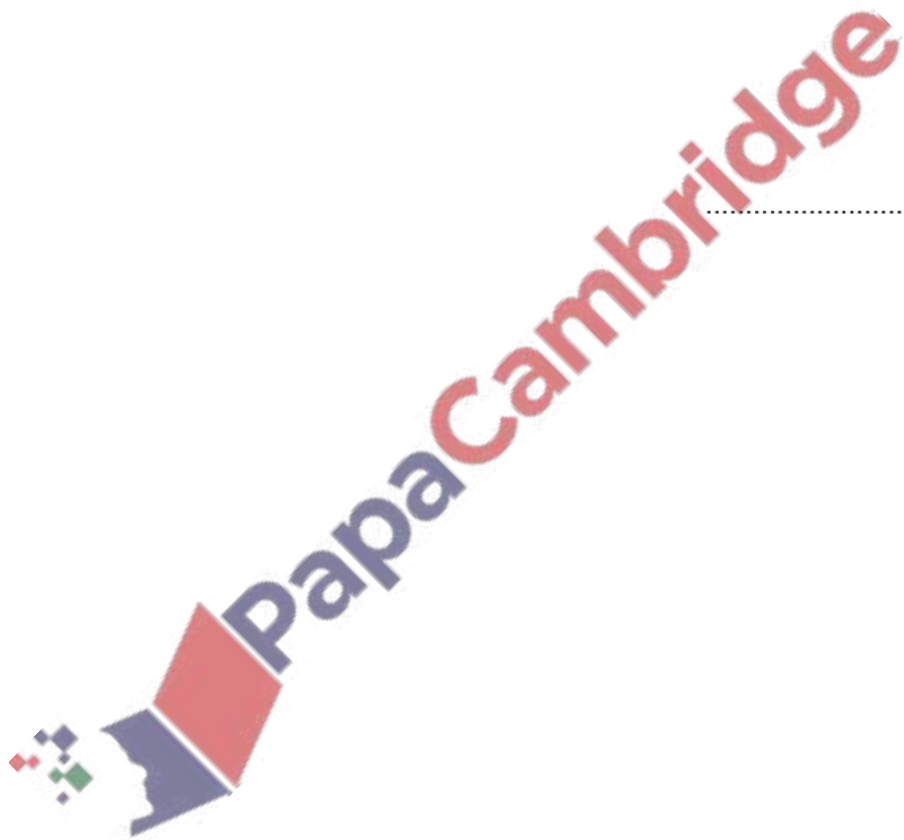
Alex and Chris share sweets in the ratio   Alex : Chris = 7 : 3.
Alex receives 20 more sweets than Chris.

Work out the number of sweets Chris receives.

.... [2]

45.
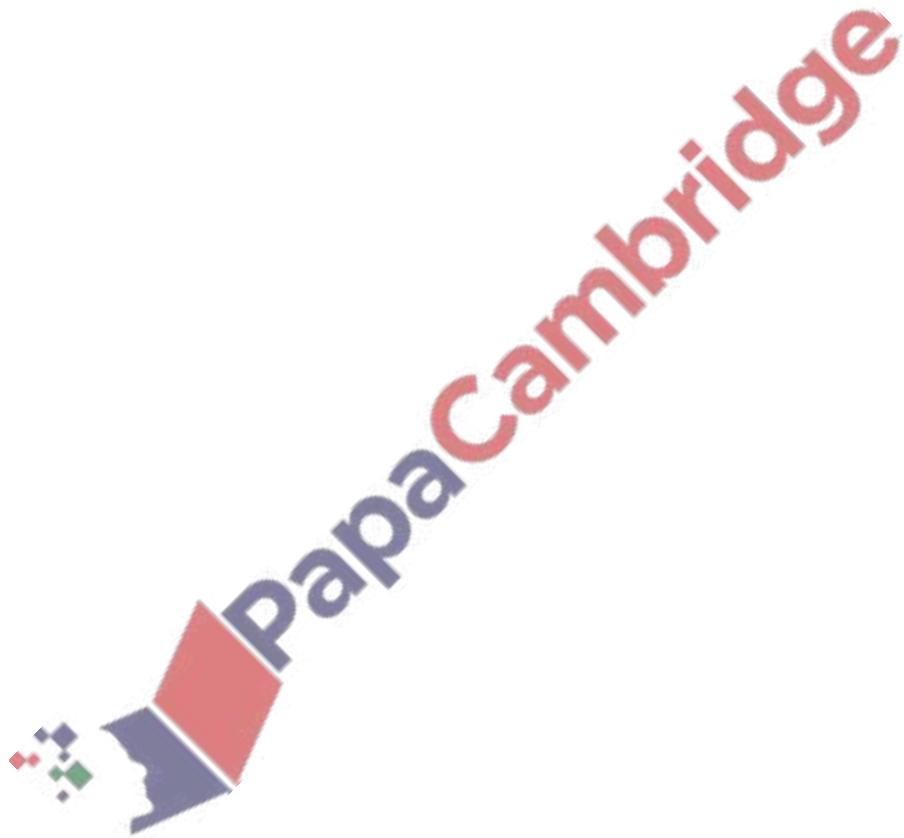
Work out $(3 \times 10^{199}) + (2 \times 10^{201})$.
Give your answer in standard form.

.... [2]
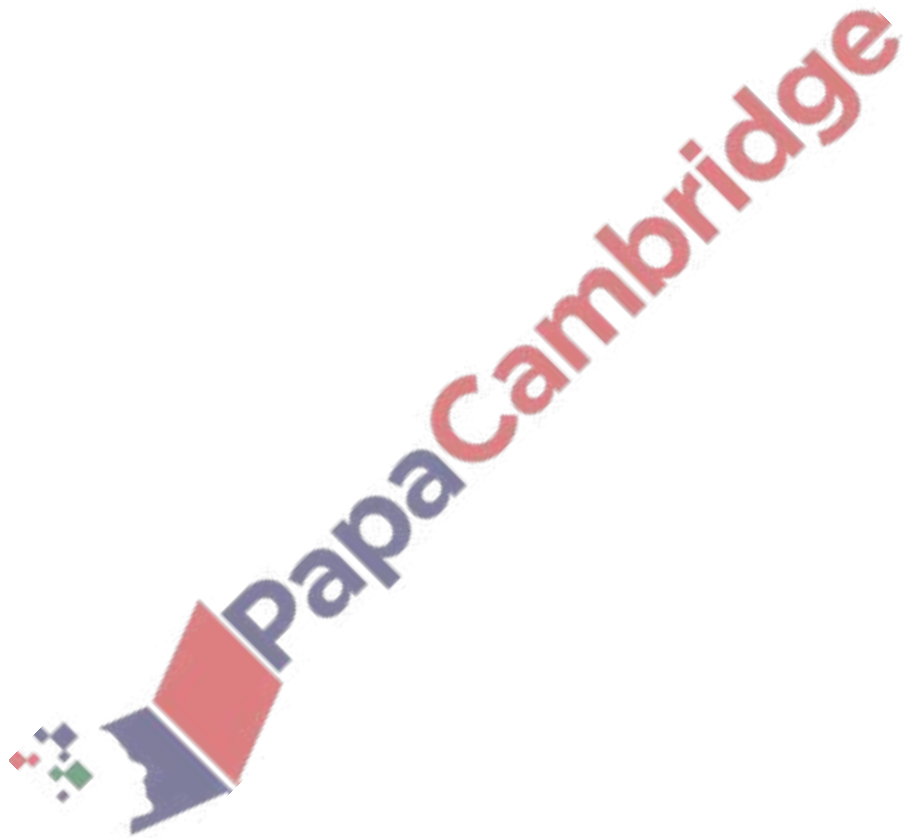
The selling price of a shirt is $26.50 .
This includes a tax of 6%.

Calculate the price of the shirt before the tax was added.

$ .... [2]
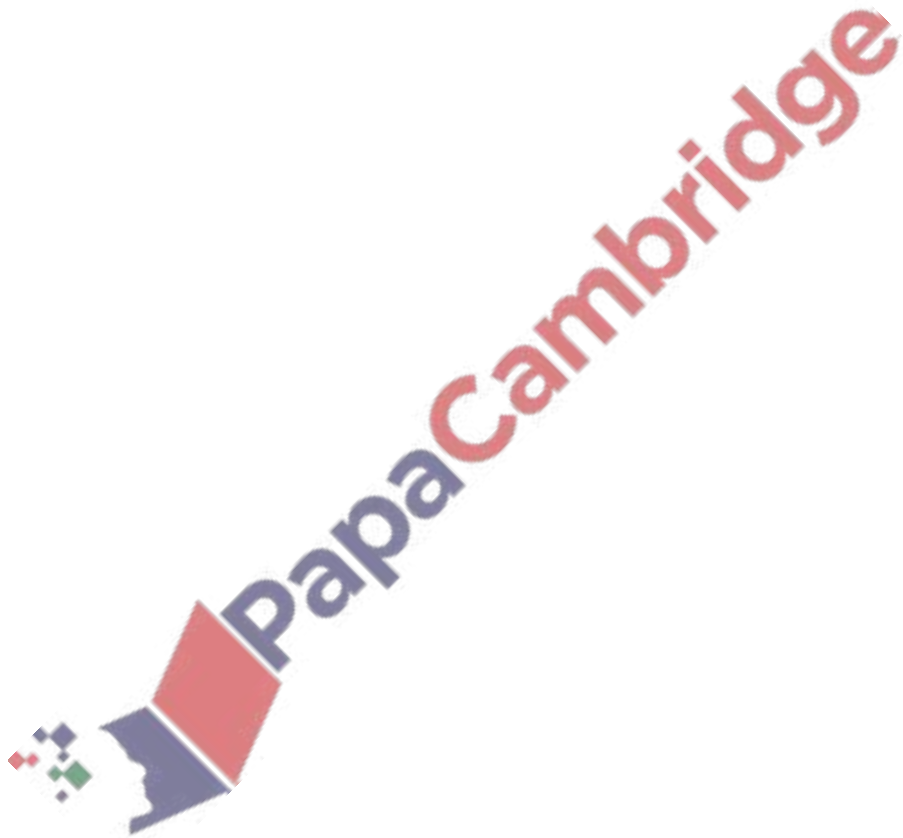
The sides of an isosceles triangle are measured correct to the nearest millimetre.
One side has a length of 8.2 cm and another has a length of 9.4 cm.

Find the largest possible value of the perimeter of this triangle.

.... cm [3]
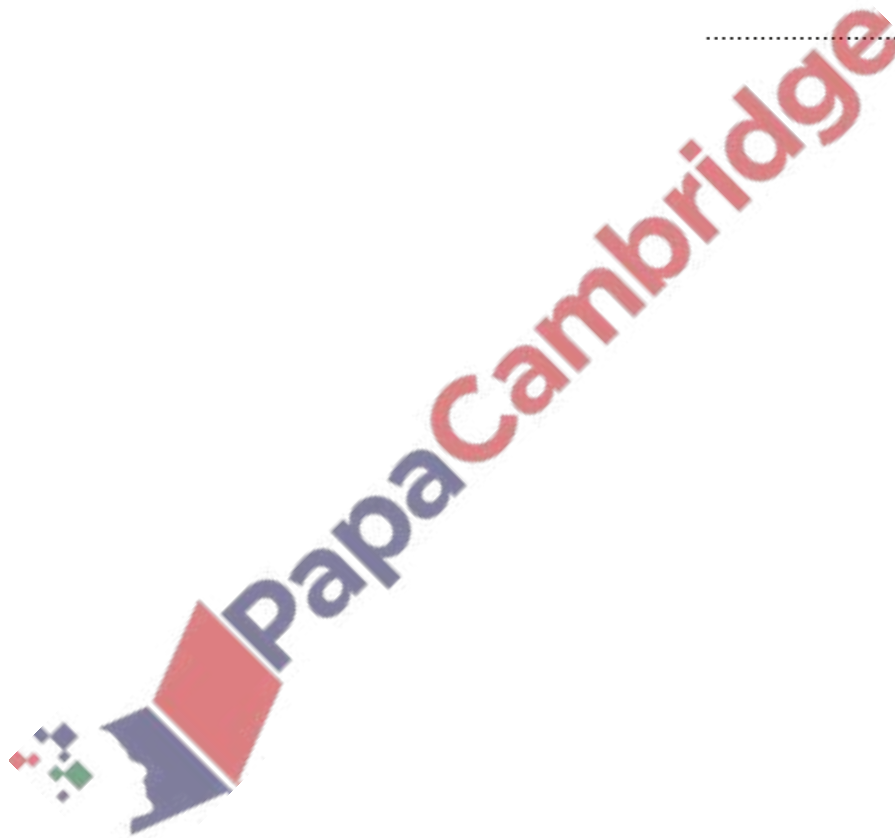
Write down the cube number that is greater than 50 but less than 100.

.... [1]
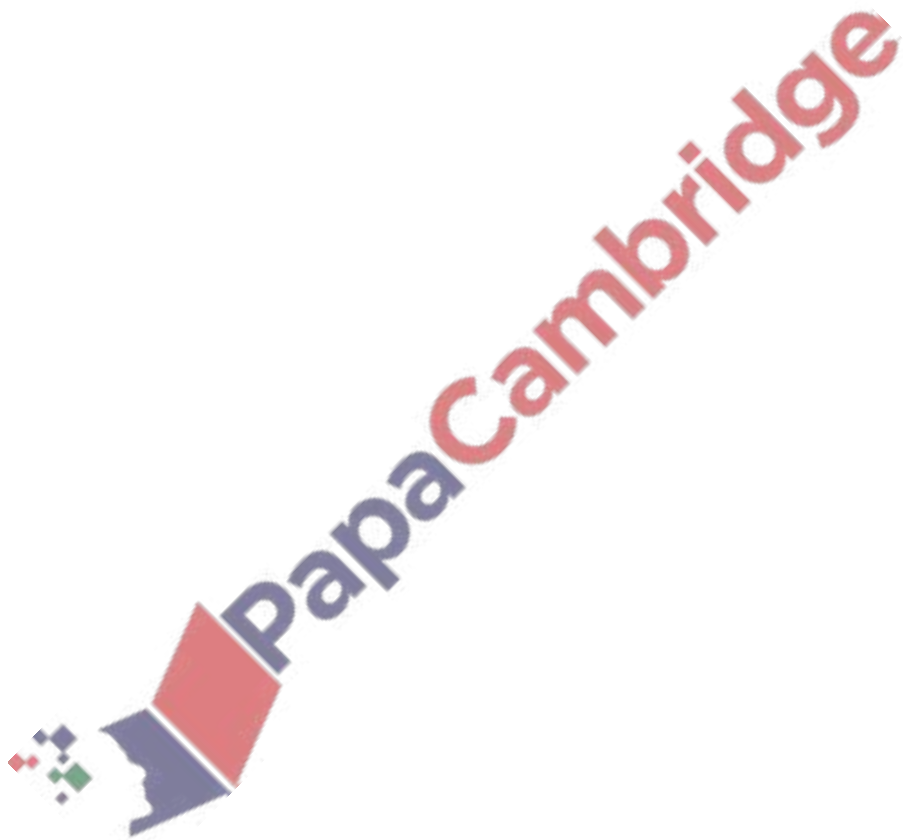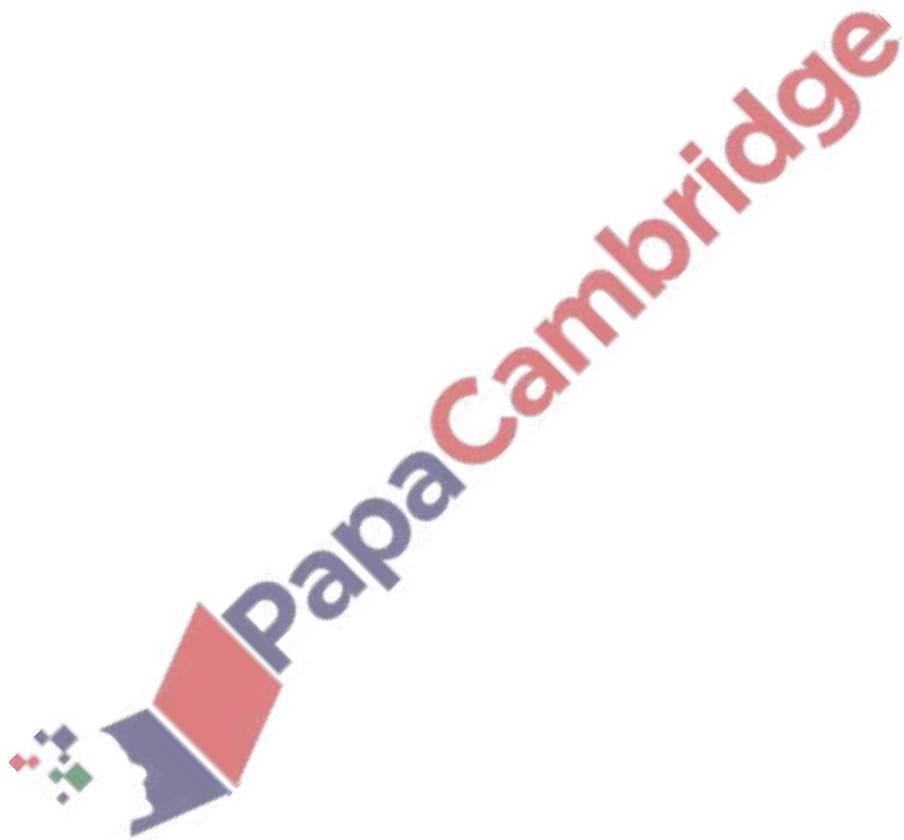
49.

Calculate.

$$\frac{4}{\sqrt{0.0025}}$$

.... [1]

Thor changes 40 000 Icelandic Krona into dollars when the exchange rate is 1 krona = $0.0099 .

Work out how many dollars he receives.

$ .... [1]

51.
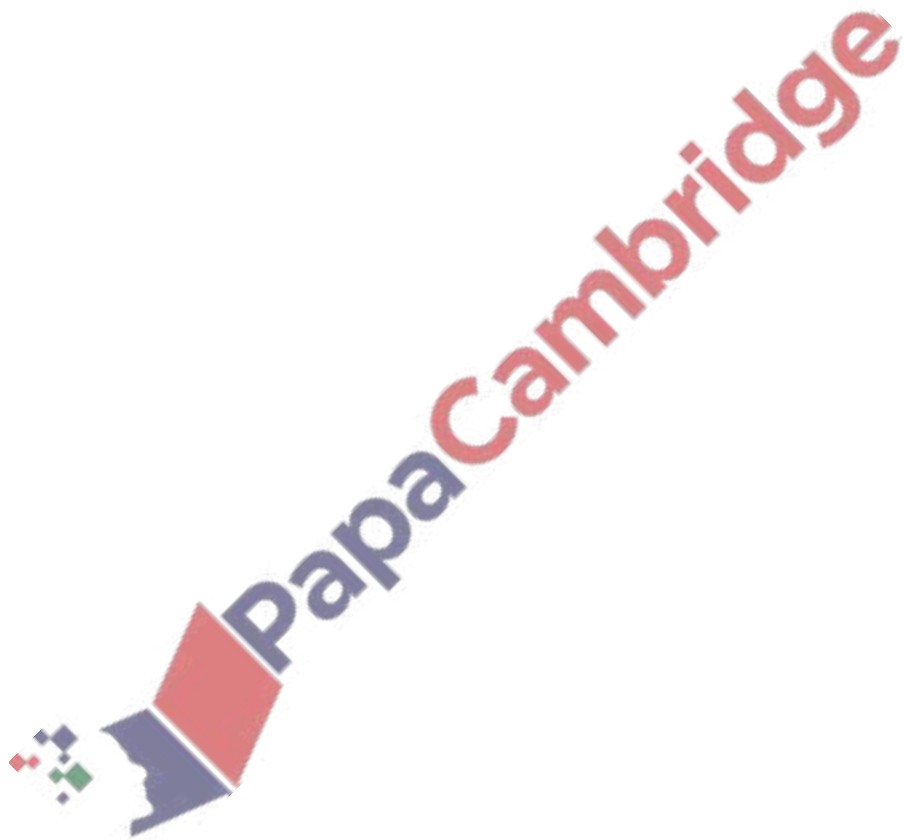
Change $457\,000\,\text{cm}^2$ into m^2.

....m^2 [1]
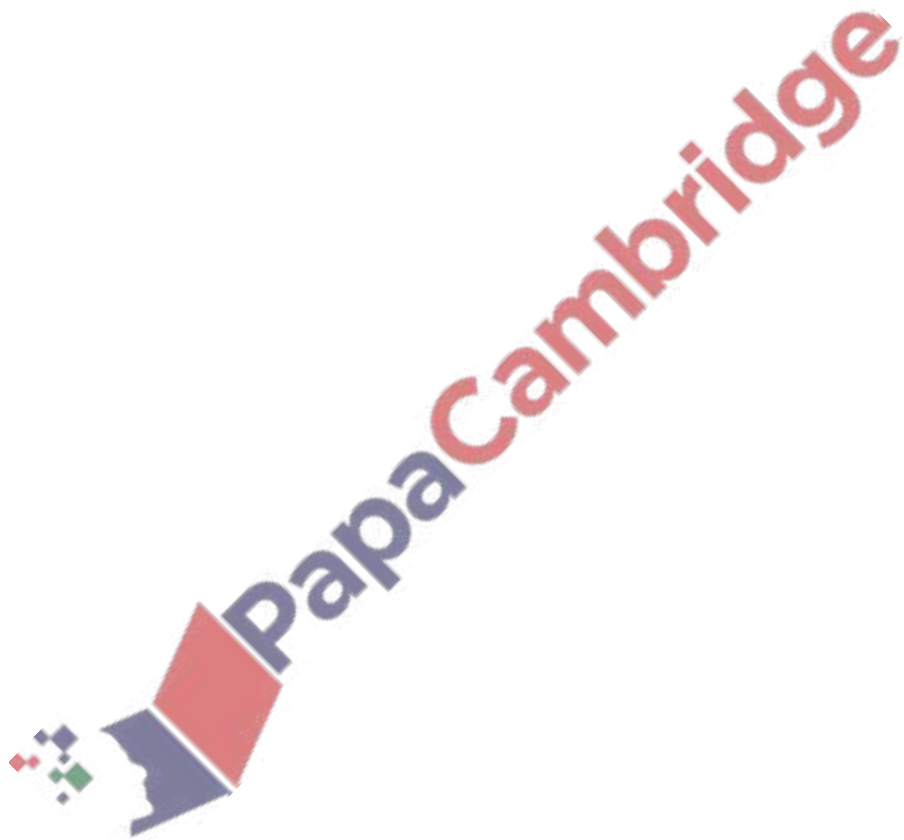
The length, l cm, of a line is 18.3 cm, correct to the nearest millimetre.

Complete this statement about the value of l.

.... $\leqslant l <$ .... [2]

53.
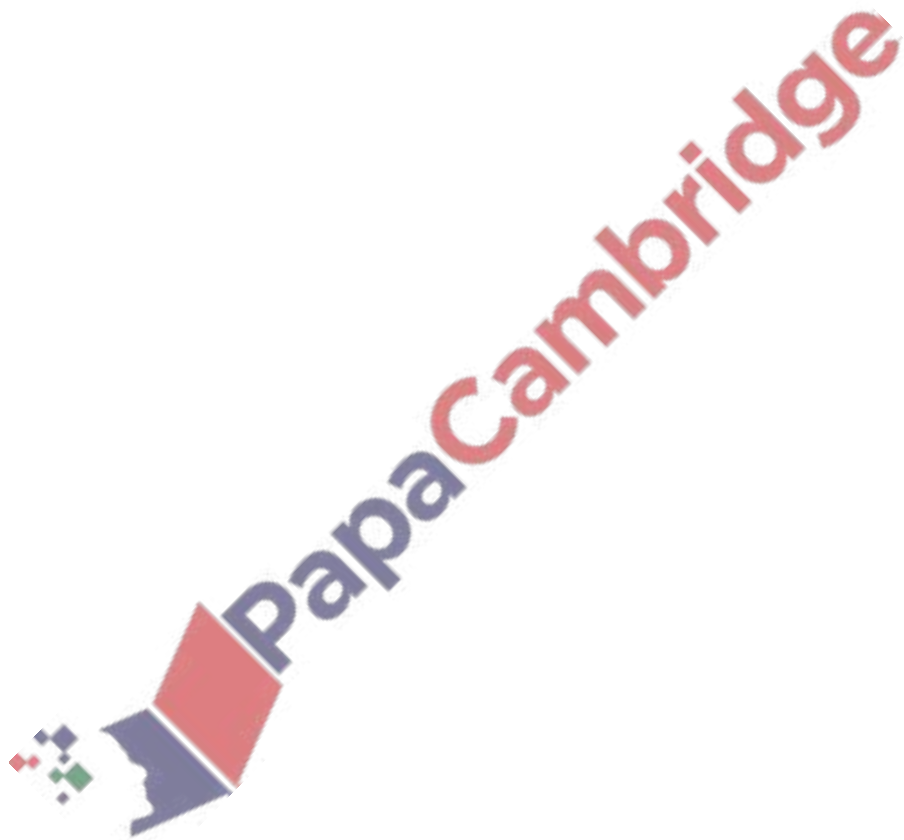
Without using a calculator, work out $1\frac{1}{7} \times 2\frac{1}{10}$.

You must show all your working and give your answer as a mixed number in its simplest form.

.... [3]
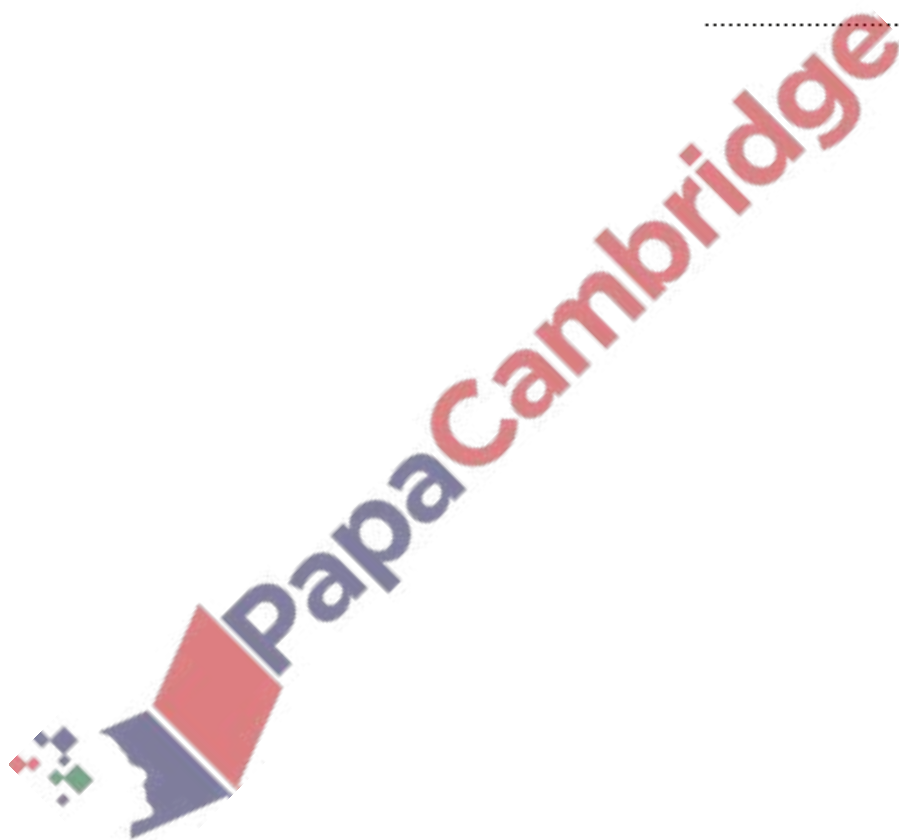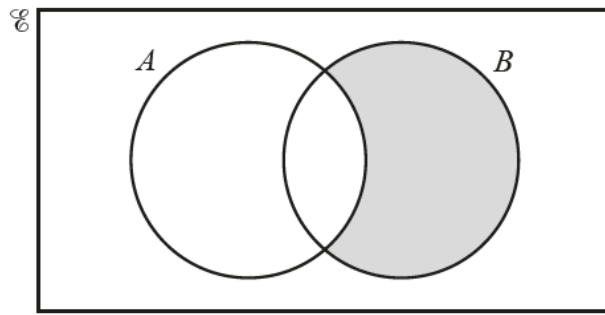
Use set notation to describe the shaded region.

.... [1]
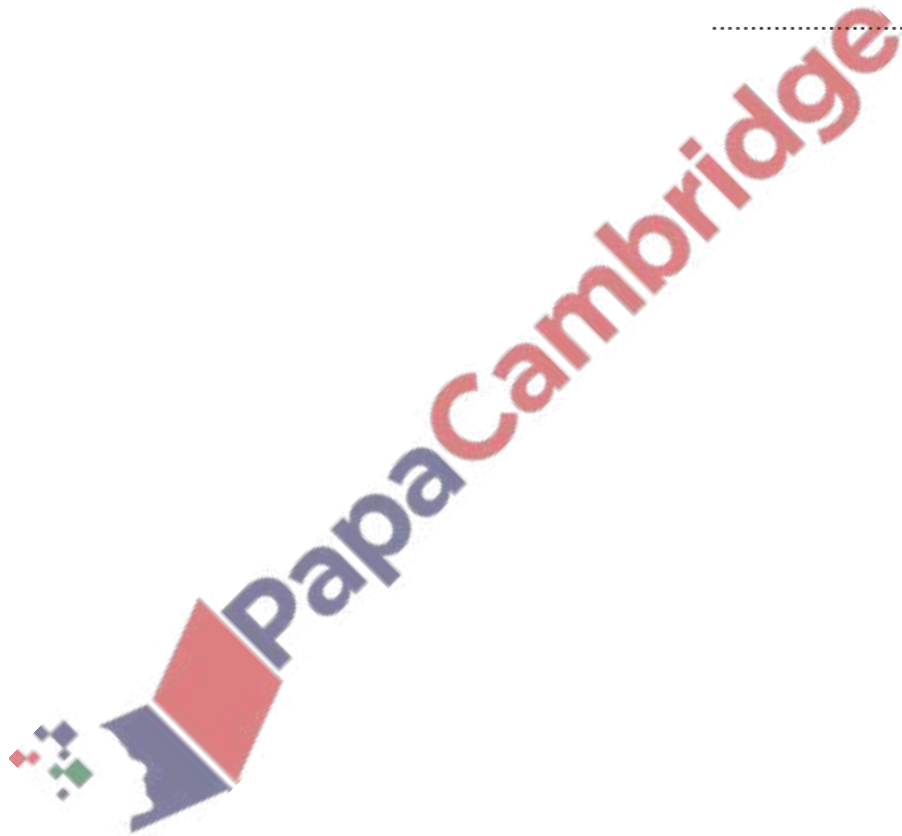
$$N = 2^4 \times 3 \times 7^5$$

$PN = K$, where P is an integer and K is a square number.

Find the smallest value of P.

$P = $ .... [2]
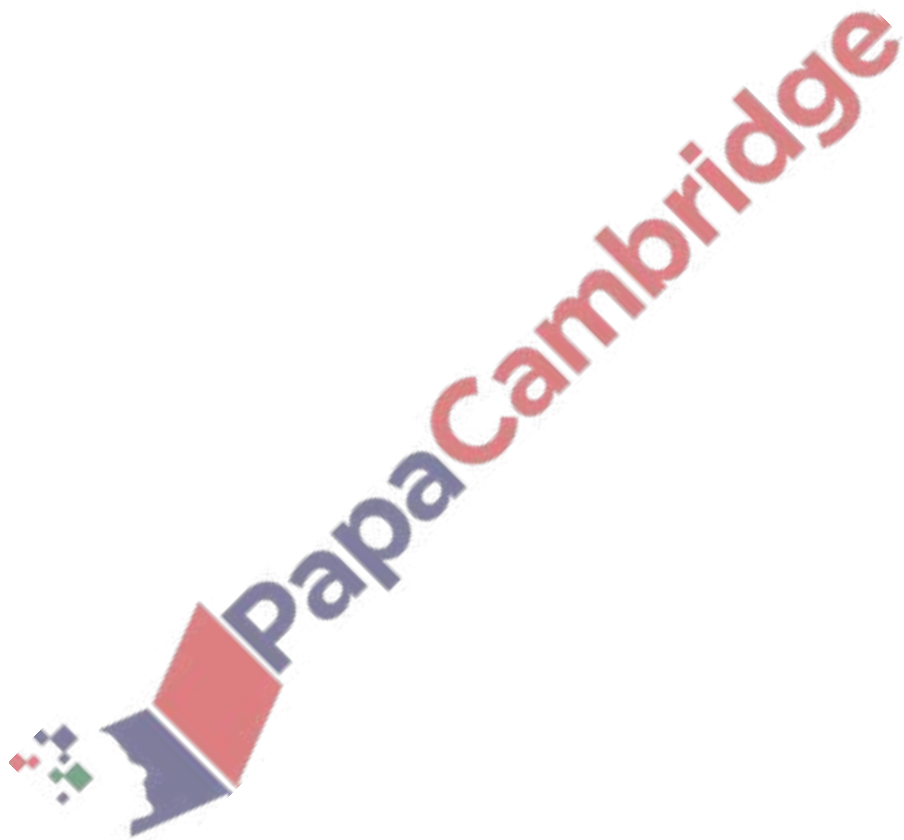
56.

A paperweight has height $4\,\text{cm}$ and volume $38.4\,\text{cm}^3$.
A mathematically similar paperweight has height $7\,\text{cm}$.

Calculate the volume of this paperweight.

.... cm^3 [3]
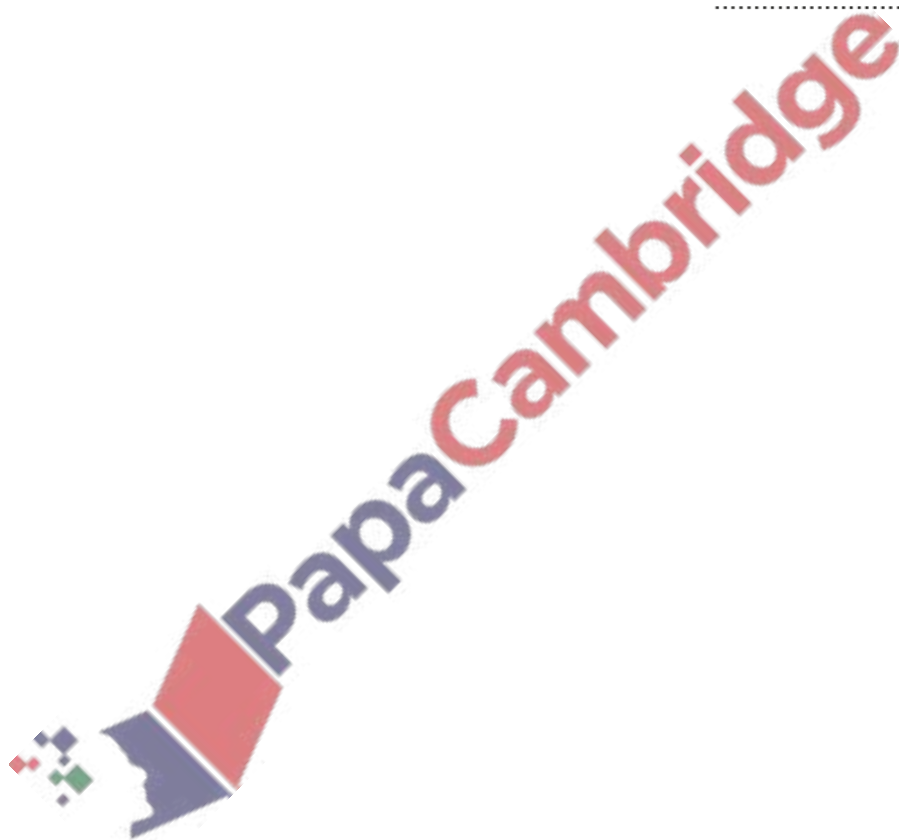
Adil and Brian are paid the same wage.
Adil is given a 7% pay decrease and his new wage is $427.80 .
Brian is given a 7% pay increase.

Work out Brian's new wage.
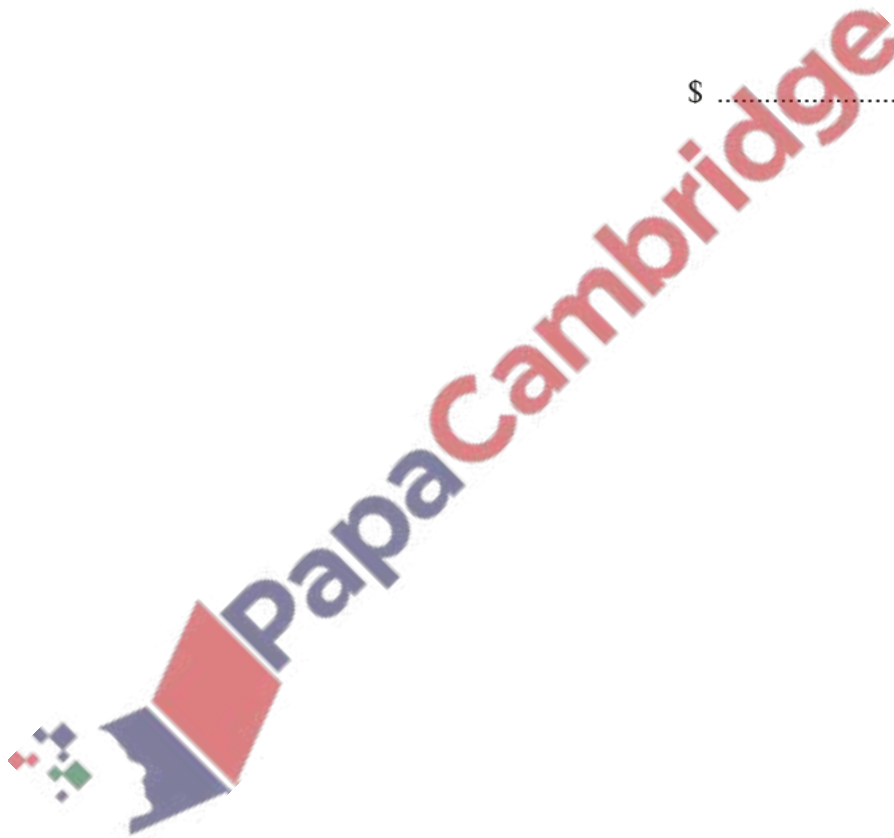
$ .... [3]

y is inversely proportional to the square root of x.
When $y = 7$, $x = 2.25$.

Write y in terms of x.

$y =$ .... [2]
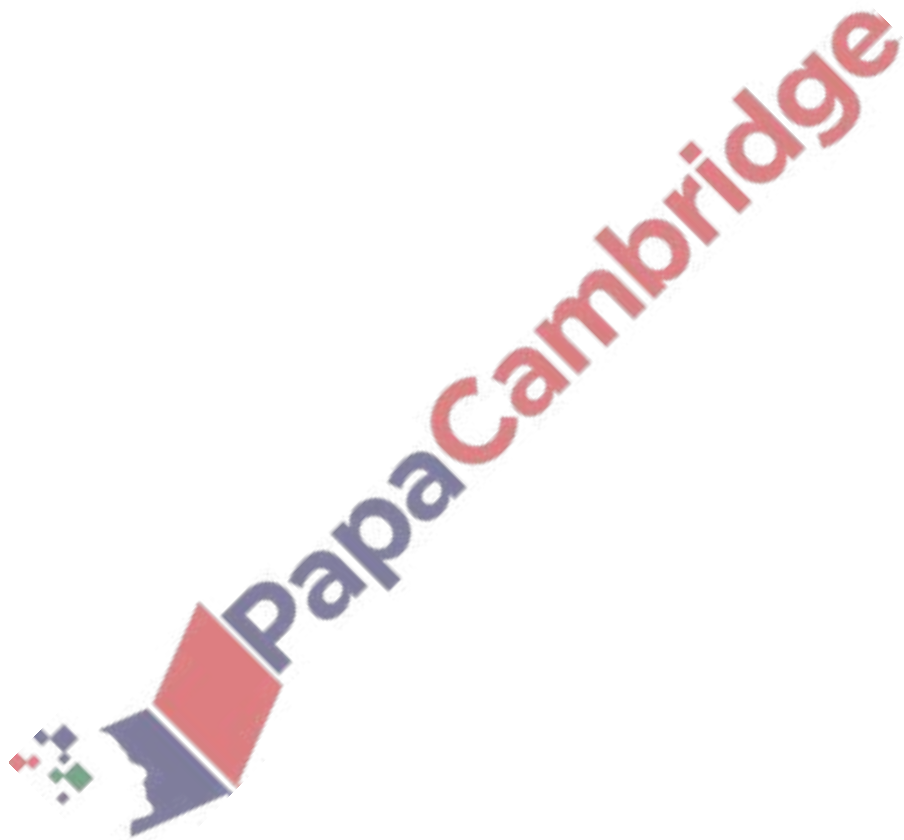
Sean is the manager of a museum.

(a) He buys a Chinese pot costing 1200 yuan.
The exchange rate is $1 = 6.4 yuan.

Work out the cost of this pot in dollars.

$ .... [1]

(b) Sean records the maximum and minimum temperatures, in °C, at the museum.
Some of the results for one week are shown in the table.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Maximum temperature (°C)	8	12	15	14	11	7	4
Minimum temperature (°C)	−5	−2	−4	−1	3		

(i) Find the difference between the maximum temperature and the minimum temperature on Wednesday.

.... °C [1]

(ii) The minimum temperature on Saturday was 2 °C higher than the minimum temperature on Monday.

Find the minimum temperature on Saturday.

.... °C [1]

(iii) In this week the range of temperatures was 23 °C.

Find the minimum temperature on Sunday.

.... °C [1]

(c) These are the opening times for the museum.

Monday to Friday   09 00 to 17 00
Saturday and Sunday   10 00 to 16 00

During opening hours the museum has 4 security guards working.
Each guard works a maximum of 30 hours each week.

Work out the smallest number of guards needed each week.

.... [4]

(d) The entry price to the museum is $18.
This price is increased by 28%.

Find the increased entry price.

$ .... [2]

60
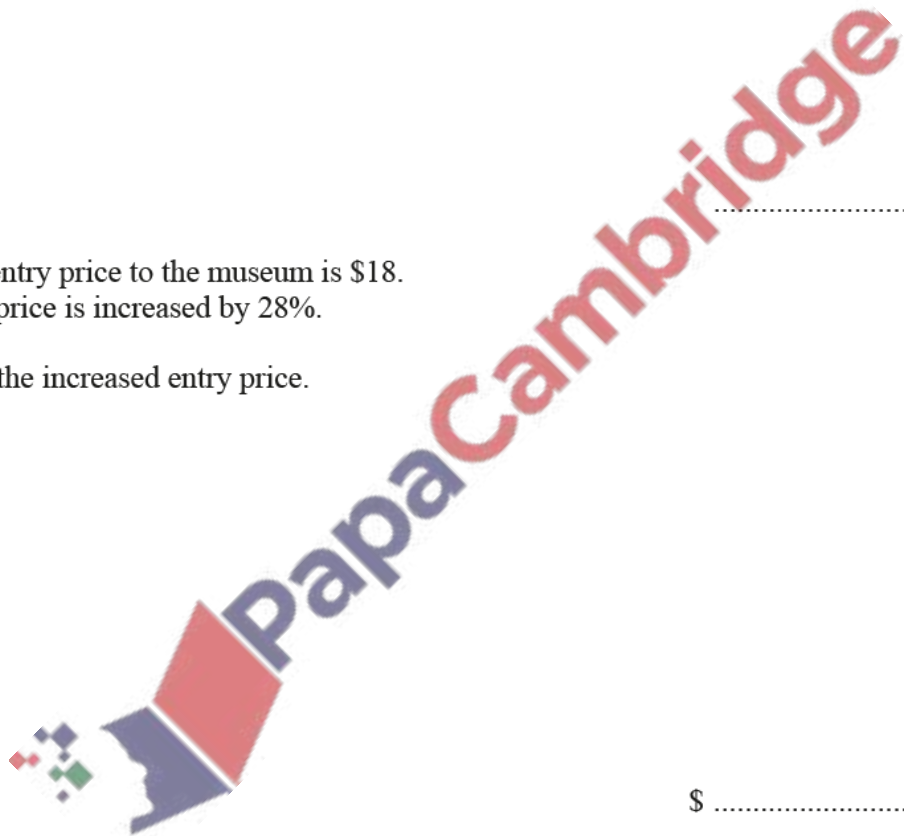
(a)

| 8 | 15 | 18 | 33 | 39 | 41 | 51 | 57 | 60 | 81 |

From this list, write down

(i) a factor of 54,

.... [1]

(ii) a multiple of 19,

.... [1]

(iii) a prime number.

.... [1]

(b) Write down the reciprocal of 64.

.... [1]

(c) (i) Write 4.81×10^{-3} as an ordinary number.

.... [1]

(ii) Write 75 000 in standard form.

.... [1]

(iii) Calculate $\dfrac{6.3 \times 10^2}{7 \times 10^{-3}}$.

Write your answer in standard form.

.... [2]

(d) (i)

$\mathscr{E} = \{2, 4, 8, 16, 32, 64\}$
$A = \{\text{square numbers}\}$
$B = \{\text{cube numbers}\}$

Use this information to complete the Venn diagram.
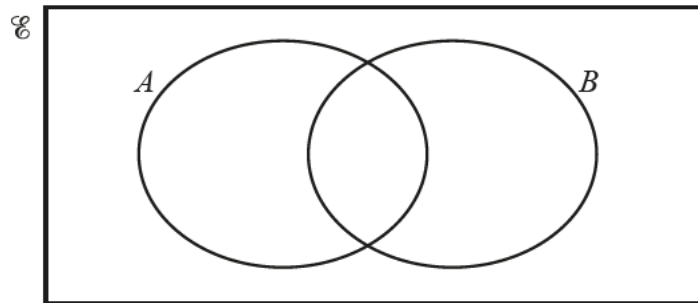
[2]

(ii) On this Venn diagram, shade the region $P \cup Q$.
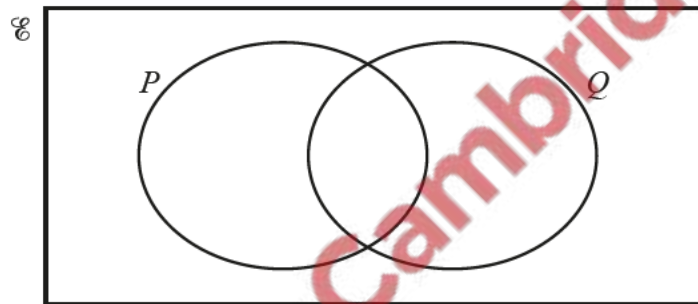
[1]
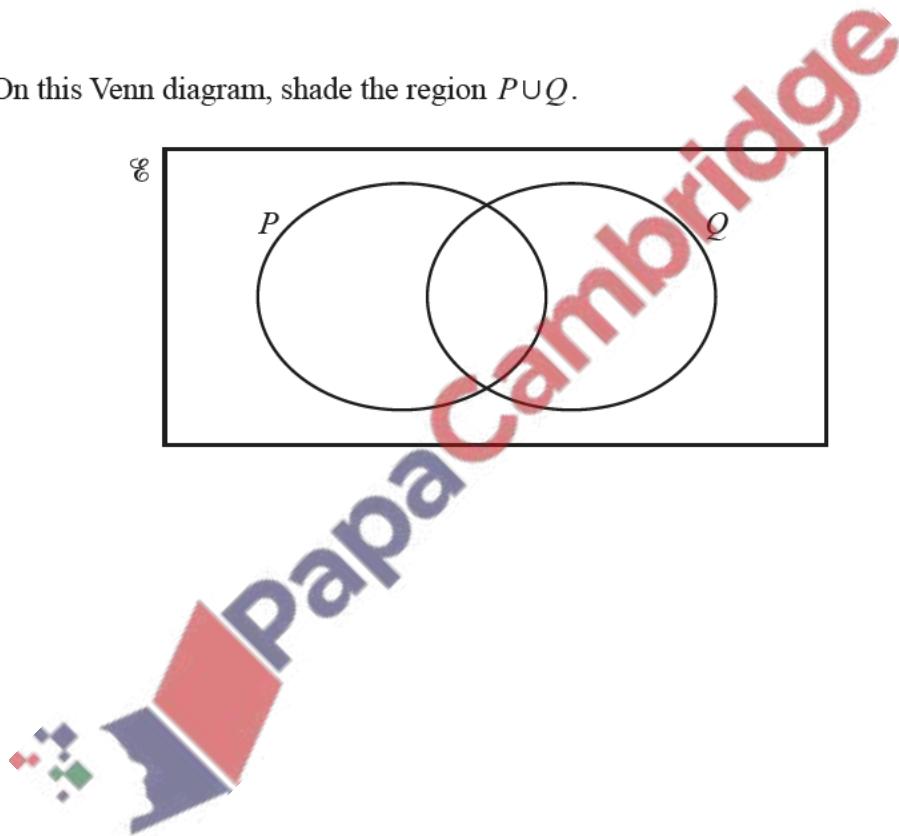
(a) Write one hundred and twenty thousand and twenty in figures.

.... [1]

(b) Find the value of $\sqrt{3481}$.

.... [1]

(c)
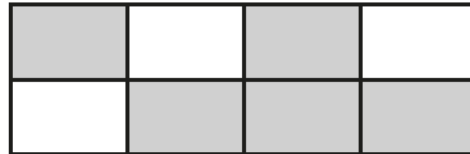
(i) Write down the fraction of the rectangle that is shaded.

.... [1]

(ii) Find the percentage of the rectangle that is **not** shaded.

....% [1]

(d) Write these numbers in order, starting with the smallest.

$$27\% \qquad \frac{5}{17} \qquad 0.268 \qquad \frac{7}{29}$$

.... < .... < .... < .... [2]
smallest

(e) Write 0.3728 correct to 1 decimal place.

.... [1]

(f) Write down the value of 19^0.

.... [1]

(g) The height, h metres, of a tower is $128\,\text{m}$, correct to the nearest metre.

Complete the statement about the value of h.

.... $\leqslant h <$ .... [2]

(h) Find the highest common factor (HCF) of 126 and 180.

.... [2]
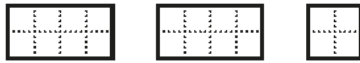
(i) Write down an irrational number with a value between 6 and 7.

.... [1]
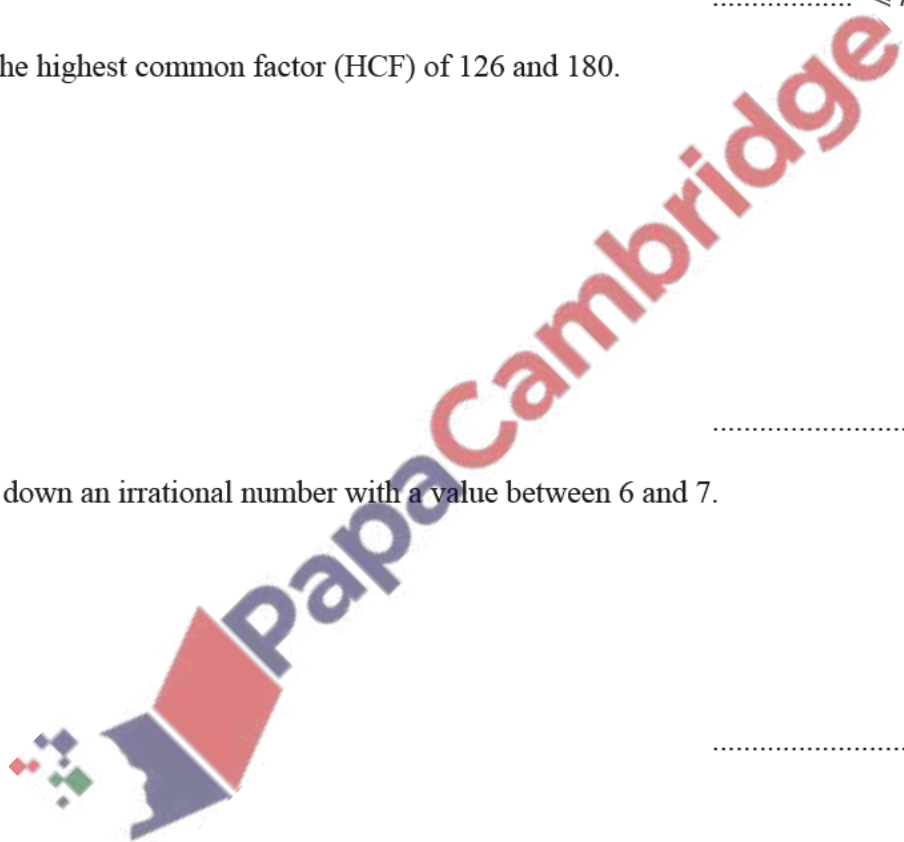
George, Louis and Beatriz have a café.

(a) George records the number of each type of meal sold.
He draws a pictogram to show his results.
All rows are complete except for Salad.

Type of meal	Number of meals
Meat curry	
Pasta	
Vegetarian	
Salad	
Fish	
Sandwich	

Key: = 8 meals

(i) Six salads were sold.

Complete the pictogram. [1]

(ii) Write down which type of meal was sold most.

.... [1]

(iii) Find the number of meals sold altogether.

.... [1]

65
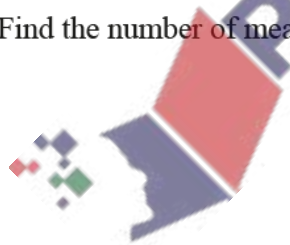
(b) The café also sells drinks.

Drinks	
Cup of tea	$2.20
Cup of coffee	$2.80
Bottle of juice	$1.50
Bottle of water	$1.35

Johan buys 2 cups of tea, 1 bottle of juice and 1 bottle of water.

Calculate the change he receives from a $10 note.

$ .... [2]

(c) These are the opening times of the café.

Monday to Friday	8 am to 6 pm
Saturday	9.30 am to 3 pm
Sunday	Closed

Work out the total number of hours the café is open in one week.

.... hours [2]

(d) One week the café makes a profit of $1027.
George, Louis and Beatriz share this profit in the ratio   George : Louis : Beatriz = 7 : 4 : 2.

Calculate the amount of money they each receive.

George $ ....

Louis $ ....

Beatriz $ .... [3]

(e) In 2019 the rent for the café was $7275.
In 2020 the rent is $7566.

Calculate the percentage increase in the rent.

.... % [2]

(f) George drives 315 km from the café to the airport.
The journey takes 3 hours 30 minutes.

Calculate his average speed.

.... km/h [1]
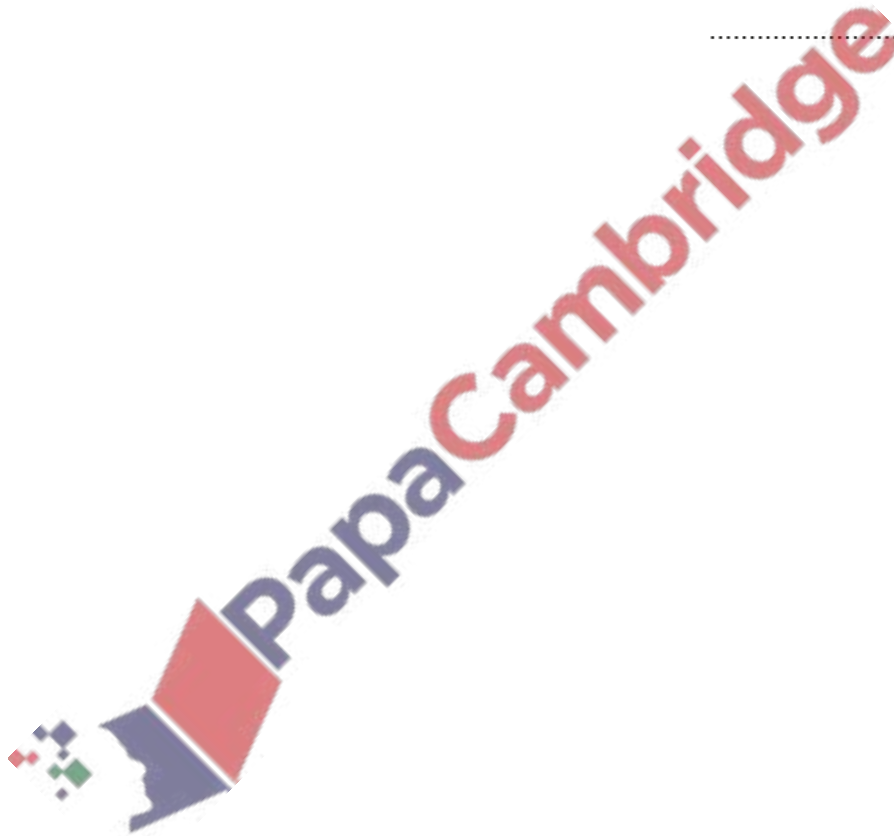
(a) Sami travels to work by bus.
The bus leaves the bus station at 07 35.

(i) It takes Sami 23 minutes to walk from his house to the bus station.

Work out the latest time Sami can leave his house.

.... [1]

(ii) The bus journey takes 41 minutes.

Work out the arrival time of the bus.

.... [1]

(b) The scale drawing shows the positions of two towns, *A* and *B*.
The scale is 1 centimetre represents 10 kilometres.

North

↑

A

North

↑

B
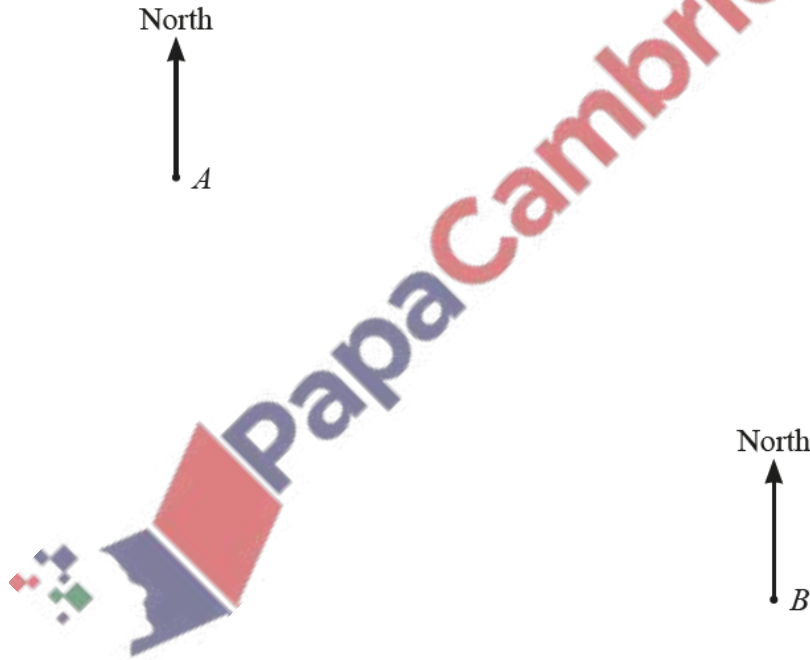
Scale : 1 cm to 10 km

(i) Work out the actual distance between town *A* and town *B*.

.... km [2]

(ii) Town *C* is 85 km from town *A* on a bearing of 100°.

On the scale drawing, mark the position of town *C*. [2]

(a) Write 60 025 in words.

.... [1]

(b) Write 849.481 correct to 1 decimal place.

.... [1]

(c) Write down

    (i) all the factors of 21,

.... [2]

    (ii) a prime number between 40 and 50.

.... [1]

(d) Write $\frac{2}{5}$ as a decimal.

.... [1]

(e) Find the value of

    (i) $\sqrt[3]{2744}$,

.... [1]

    (ii) 7^0.

.... [1]

(f) Gino invests \$6000 for 5 years at a rate of 1.2% per year compound interest.

Calculate the value of his investment at the end of the 5 years.
Give your answer correct to the nearest dollar.

\$ .... [3]

(a)

COMMONWEALTH

Lindon picks a letter at random from this word.

Explain why the probability that he picks a letter M is not $\frac{1}{10}$.

.... [1]

(b) Tickets for athletics or swimming or hockey or diving are placed in a box.
A ticket is picked at random from the box.

Sport	Athletics	Swimming	Hockey	Diving
Probability	0.12		0.09	0.4

Complete the table. [2]

(c) In a group of 40 students,

- 24 students like football
- 19 students like cricket
- 10 students like football but not cricket.
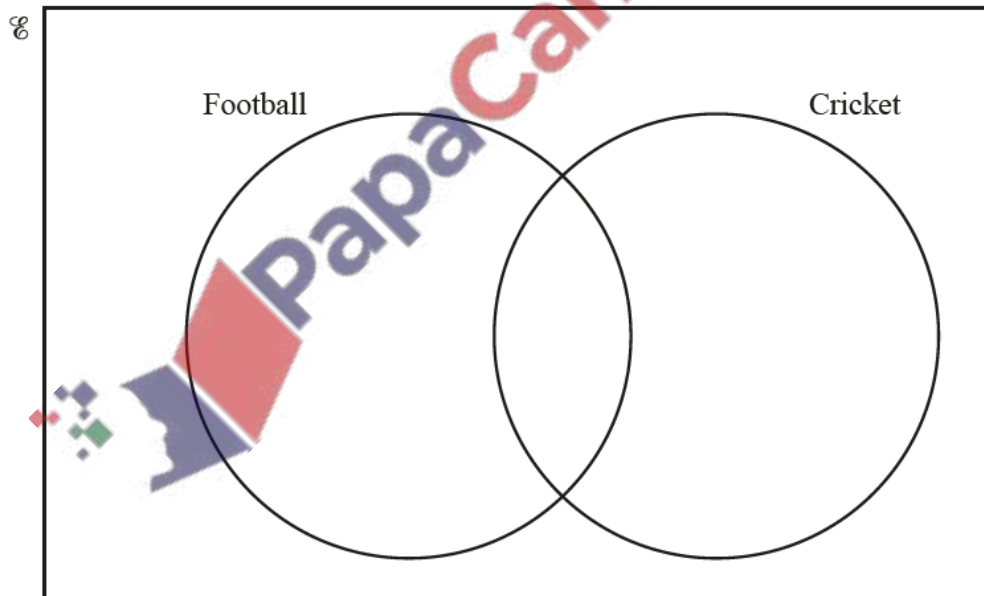
Complete the Venn diagram. [3]

(a) A cruise ship travels 2067 km.

   (i) Write 2067 in words.

   .... [1]

   (ii) Write 2067 correct to the nearest hundred.

   .... [1]

(b) When full, the cruise ship carries 880 guests and 360 crew.

   Write the ratio   guests : crew   in its simplest form.

   .... : .... [1]

(c) There are 480 cabins on the ship.
On one cruise, 456 of these cabins were used.

   Find the percentage of cabins that were used.

   .... % [1]

(d) Last year the cost of a cruise was $4600.
This year the cost of the same cruise is $4784.

   Work out the percentage increase in the cost.

   .... % [2]

(e) The cost of building the ship was $153 000 000.

   Write 153 000 000 in standard form.

   .... [1]
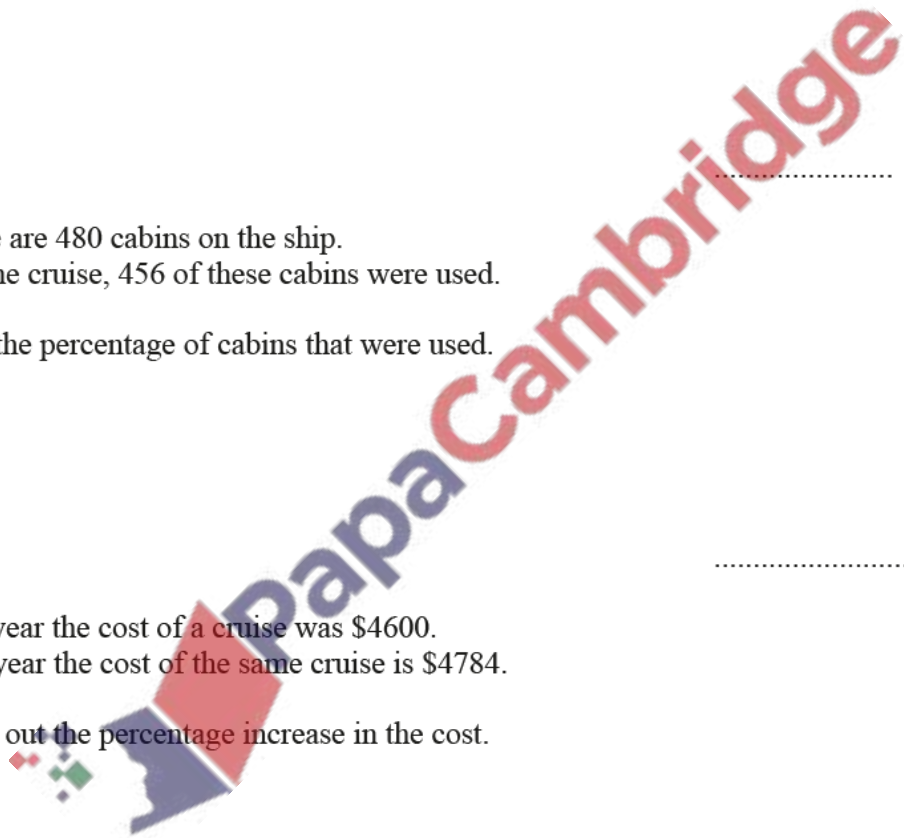
(f) There are 480 cabins on the ship.
There are four types of cabin: Ocean-view, Balcony, Interior and Suite.
Hannah starts to draw a pie chart to show the numbers of each type of cabin.
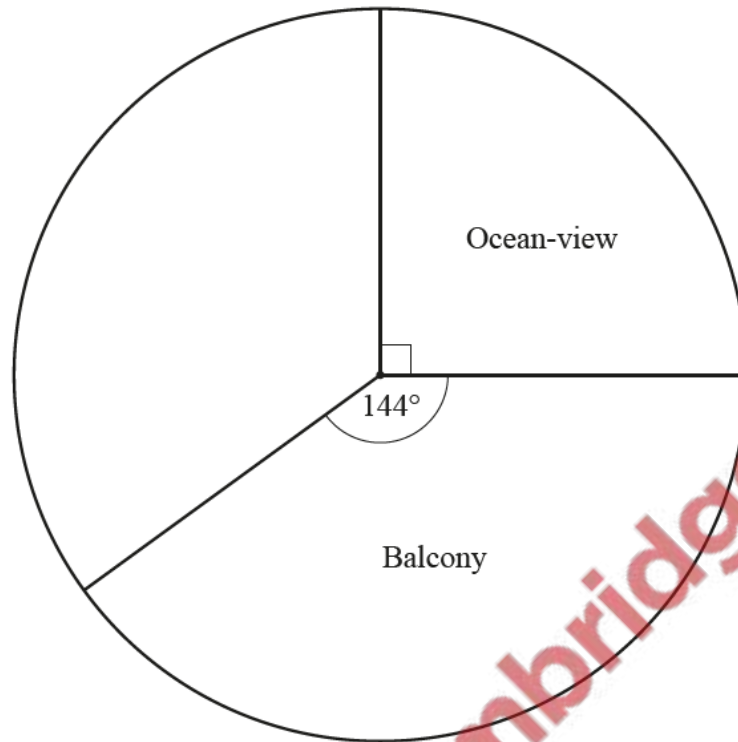
(i) Show that there are 120 Ocean-view cabins on the ship.

[1]

(ii) The table shows information about each type of cabin.

Type of cabin	Number of cabins	Sector angle in a pie chart
Ocean-view	120	90°
Balcony	192	144°
Interior	68	
Suite	100	

(a) Complete the table.

[2]

(b) Complete the pie chart. [1]

(a) Using numbers from 55 to 85, write down

    (i) a multiple of 23,

    .... [1]

    (ii) a factor of 120,

    .... [1]

    (iii) a common multiple of 8 and 12,

    .... [1]

    (iv) a number that is **both** square **and** odd,

    .... [1]

    (v) a number that has exactly 2 factors.

    .... [1]

(b) Write 220 as the product of its prime factors.

    .... [2]

68.
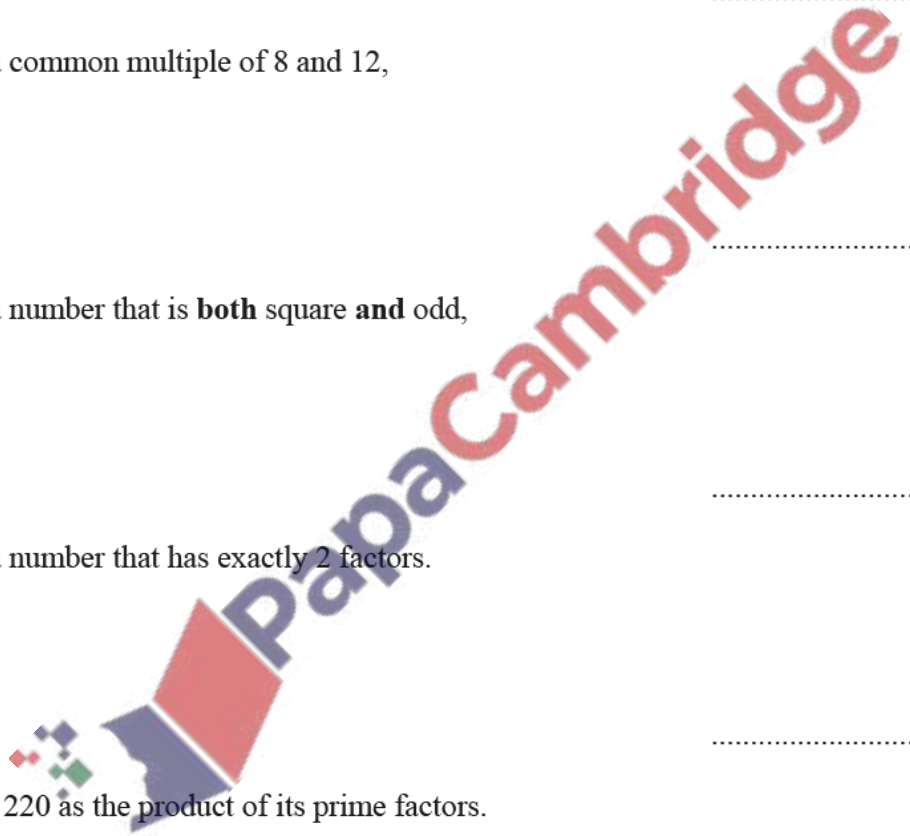
(c) Robert buys a car for $18 160.

He pays a deposit of $6460.
He pays the rest of the money in 24 equal monthly payments.

Work out the amount of each monthly payment.

$ .... [3]

(d) A fuel tank holds 52 litres when full.
The tank is a quarter full.
Jim fills the tank with fuel that costs $2.18 per litre.

Work out how much Jim pays.

$ .... [3]

74
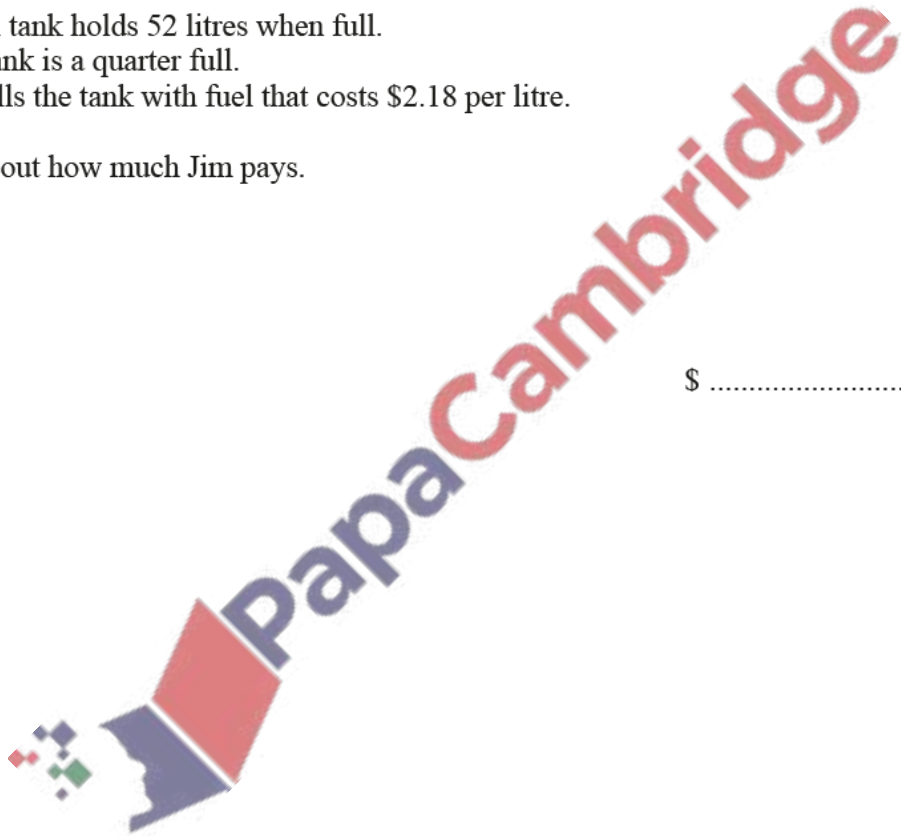
(a) A plane has 14 First Class seats, 70 Premium seats and 168 Economy seats.

Find the ratio   First Class seats : Premium seats : Economy seats.
Give your answer in its simplest form.

.... : .... : .... [2]

(b) (i) For a morning flight, the costs of tickets are in the ratio

First Class : Premium : Economy = 14 : 6 : 5.

The cost of a Premium ticket is $114.

Calculate the cost of a First Class ticket and the cost of an Economy ticket.

First Class $ ....

Economy $ .... [3]

(ii) For an afternoon flight, the cost of a Premium ticket is reduced from $114 to $96.90 .

Calculate the percentage reduction in the cost of a ticket.

.... % [2]

(c) When the local time in Athens is 09 00, the local time in Berlin is 08 00.
A plane leaves Athens at 13 15.
It arrives in Berlin at 15 05 local time.

(i) Find the flight time from Athens to Berlin.

.... h .... min [1]

(ii) The distance the plane flies from Athens to Berlin is 1802 km.

Calculate the average speed of the plane.
Give your answer in kilometres per hour.

.... km/h [2]

(a) There are 32 students in a class.

> 5 do not study any languages.
> 15 study German (*G*).
> 18 study Spanish (*S*).
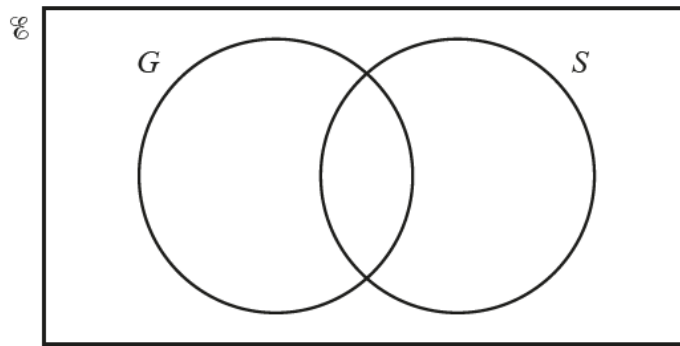
(i) Complete the Venn diagram to show this information. [2]

(ii) A student is chosen at random.

Find the probability that the student studies Spanish but not German.

.... [1]

(iii) A student who studies German is chosen at random.

Find the probability that this student also studies Spanish.

.... [1]
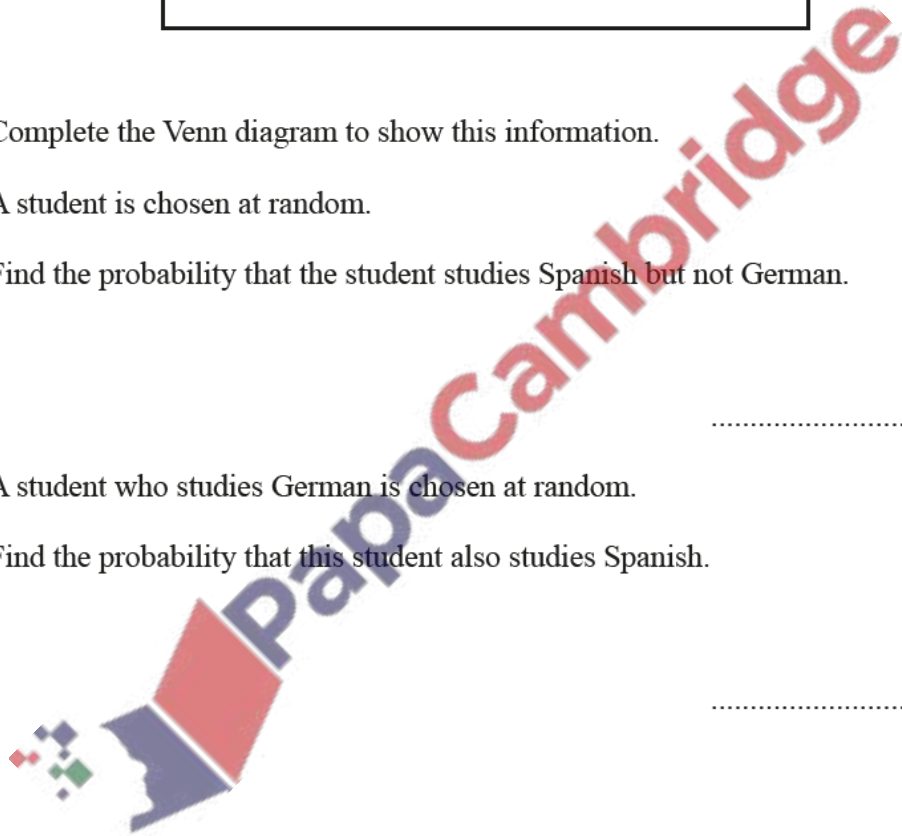
(b) A bag contains 54 red marbles and some blue marbles.
36% of the marbles in the bag are red.

Find the number of blue marbles in the bag.

.... [2]

(c) Another bag contains 15 red beads and 10 yellow beads.
Ariana picks a bead at random, records its colour and replaces it in the bag.
She then picks another bead at random.

   (i) Find the probability that she picks two red beads.

.... [2]

   (ii) Find the probability that she does not pick two red beads.

.... [1]

(d) A box contains 15 red pencils, 8 yellow pencils and 2 green pencils.
Two pencils are picked at random without replacement.

Find the probability that at least one pencil is red.

.... [3]

Karel travelled from London to Johannesburg and then from Johannesburg to Windhoek.

(a) The flight from London to Johannesburg took 11 hours 10 minutes.
The average speed was 813 km/h.

Calculate the distance travelled from London to Johannesburg.
Give your answer correct to the nearest 10 km.

.... km [3]

(b) The total time for Karel's journey from London to Windhoek was 15 hours 42 minutes.
The total distance travelled from London to Windhoek was 10 260 km.

(i) Calculate the average speed for this journey.

.... km/h [2]
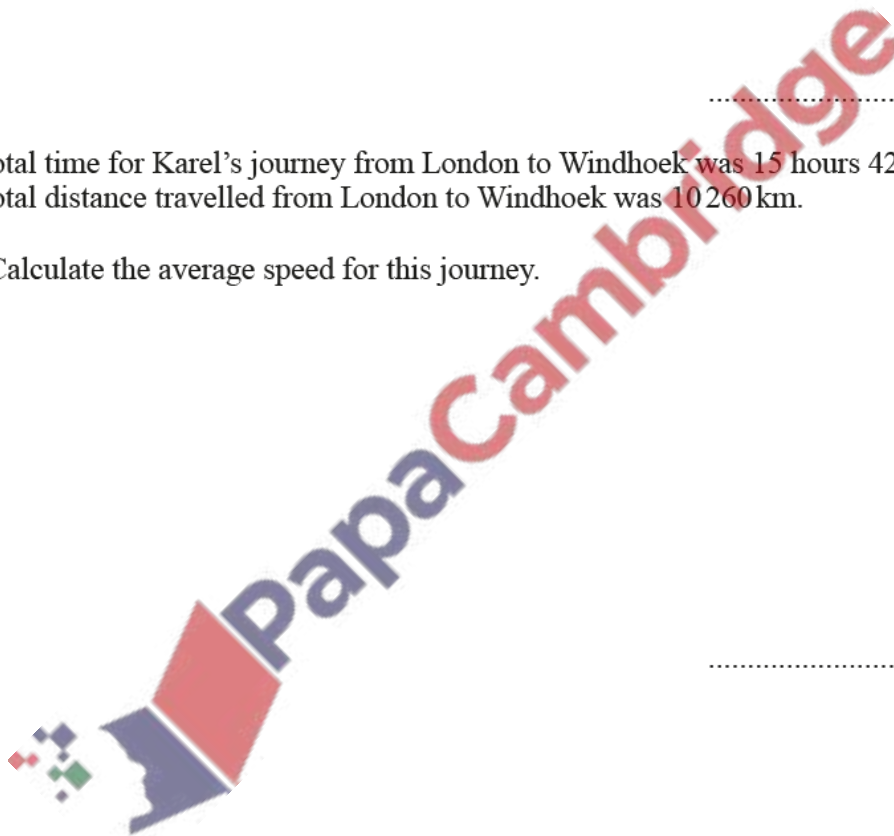
(ii) The cost of Karel's journey from London to Windhoek was $470.

    (a) Calculate the distance travelled per dollar.

                                                        .... km per dollar [1]

    (b) Calculate the cost per 100 km of this journey.
           Give your answer correct to the nearest cent.

                                         $ .... per 100 km [2]

(c) Karel changed $300 into 3891 Namibian dollars.

    Complete the statement.

                        $1 = ... Namibian dollars   [1]
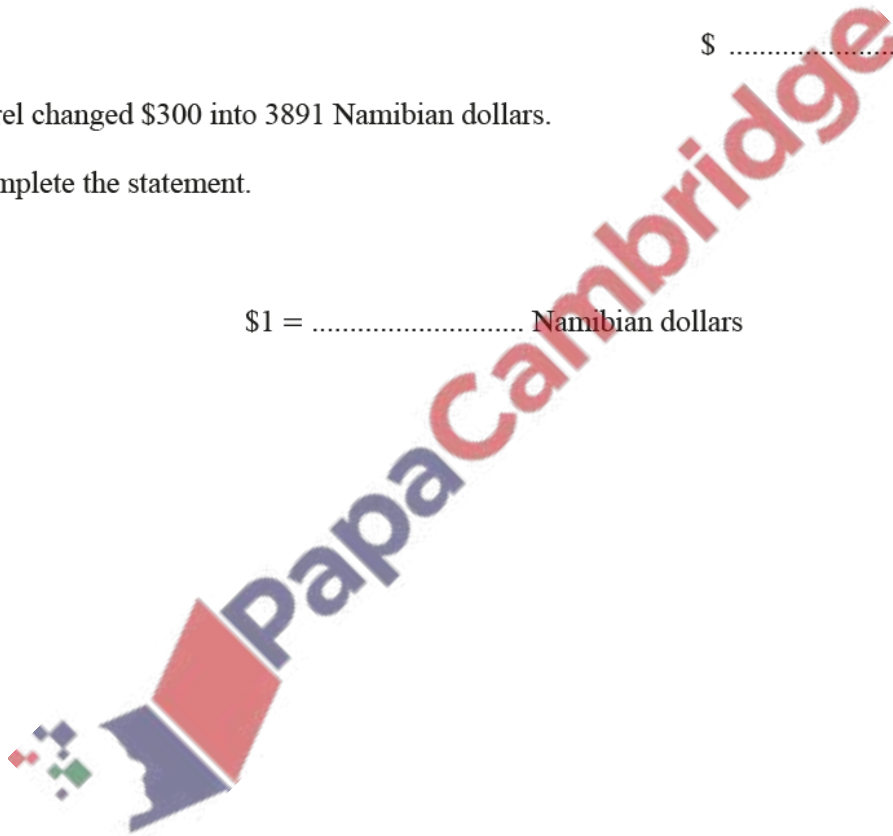
(a) Beth invests $2000 at a rate of 2% per year compound interest.

(i) Calculate the value of this investment at the end of 5 years.

$ .... [2]

(ii) Calculate the overall percentage increase in the value of Beth's investment at the end of 5 years.

.... % [2]

(iii) Calculate the minimum number of complete years it takes for the value of Beth's investment to increase from $2000 to more than $2500.

.... [3]
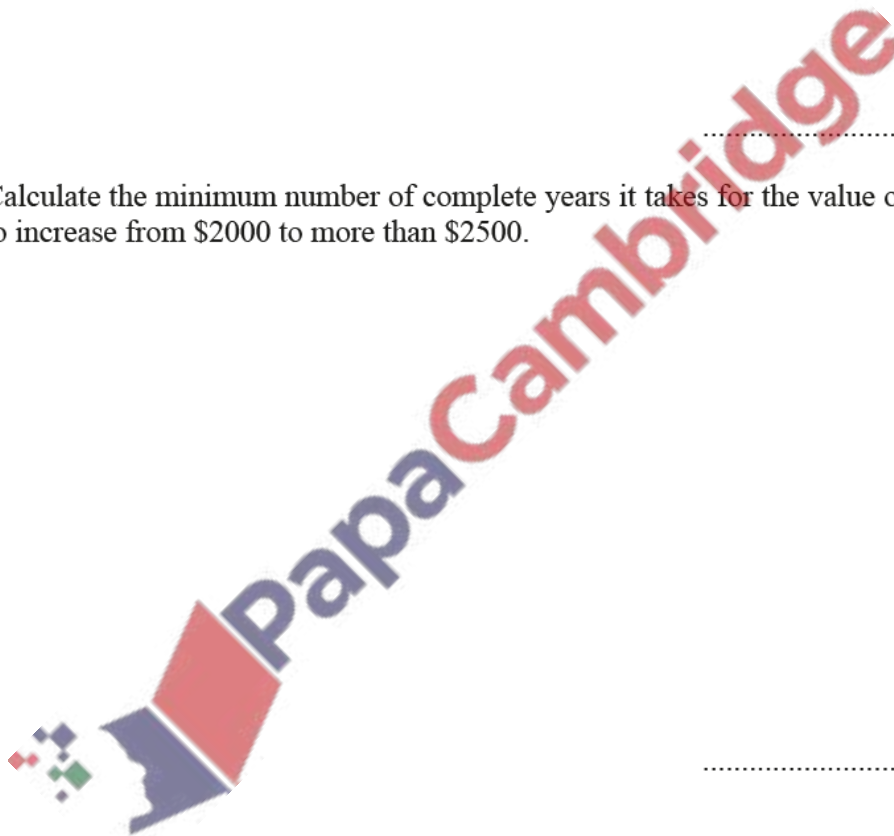
(b) The population of a village decreases exponentially at a rate of 4% each year.
The population is now 255.

Calculate the population 16 years ago.

.... [3]
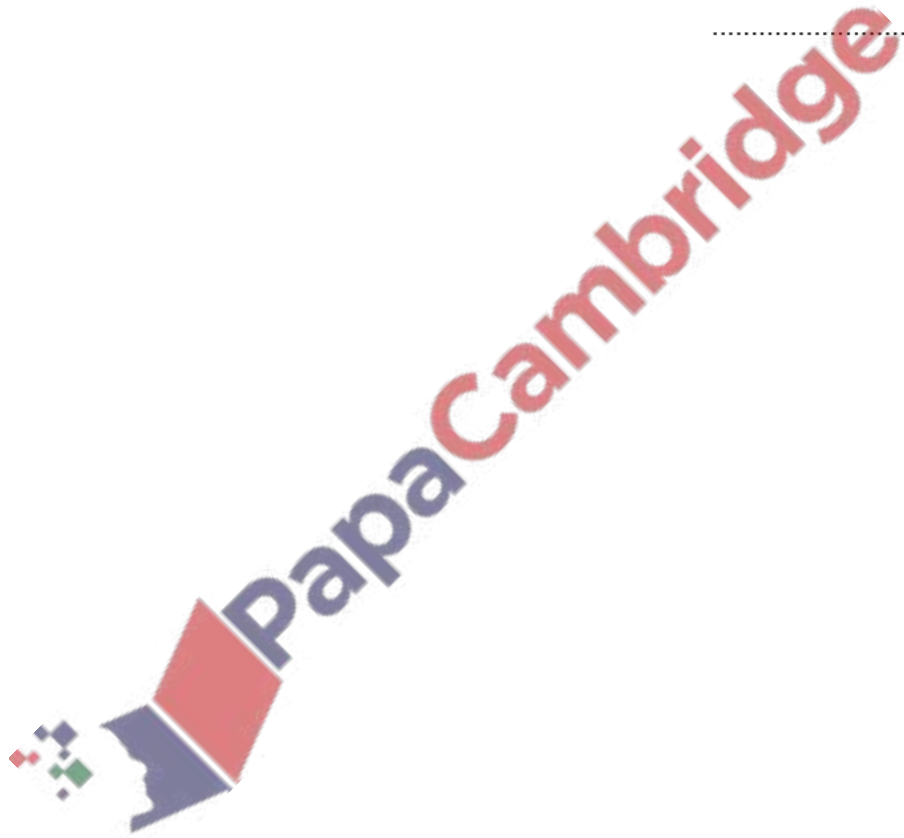
(a) The Earth has a surface area of approximately $510\,100\,000\,\text{km}^2$.

   (i) Write this surface area in standard form.

                                              .... km^2 [1]

   (ii) Water covers 70.8% of the Earth's surface.

       Work out the area of the Earth's surface covered by water.

                                              .... km^2 [2]

(b) The table shows the surface area of some countries and their estimated population in 2017.

Country	Surface area (km^2)	Estimated population in 2017
Brunei	5.77×10^3	433 100
China	9.60×10^6	1 388 000 000
France	6.41×10^5	67 000 000
Maldives	3.00×10^2	374 600

   (i) Find the total surface area of Brunei and the Maldives.

                                              .... km^2 [1]

   (ii) The ratio   surface area of the Maldives : surface area of China
      can be written in the form $1 : n$.

      Find the value of n.

                               $n = $ .... [2]

(iii) Find the surface area of France as a percentage of the surface area of China.

.... % [2]

(iv) Find the population density of the Maldives.
[Population density = population ÷ surface area]

.... people/km^2 [2]

(c) The population of the Earth in 2017 was estimated to be 7.53×10^9.

The population of the Earth in 2000 was estimated to be 6.02×10^9.

(i) Work out the percentage increase in the Earth's estimated population from 2000 to 2017.

.... % [2]

(ii) Assume that the population of the Earth increased exponentially by y% each year for these 17 years.

Find the value of y.

$y =$ .... [3]

74.

    (a) Write 3.25 pm in the 24-hour clock.

                                        .... [1]

    (b) Work out the time 7 hours and 36 minutes before 13 26.

                                          .... [1]
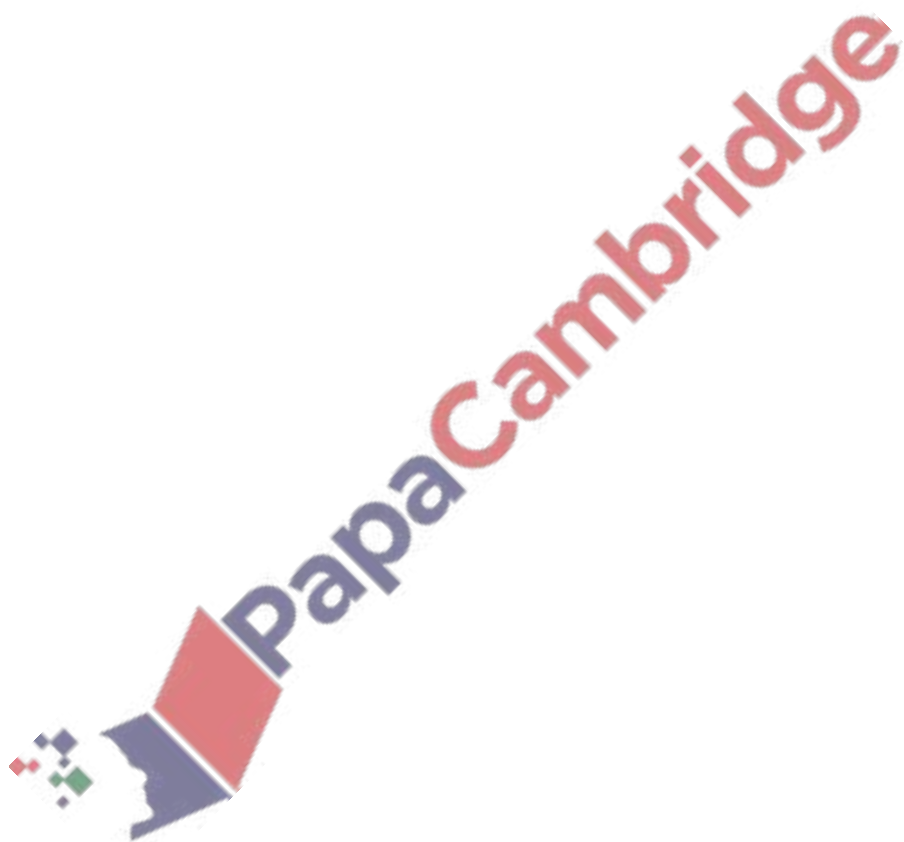
(a) The temperature on Monday was $-7\,°C$.
The temperature on Tuesday was $5\,°C$ lower than on Monday.
The temperature on Wednesday was $8\,°C$ higher than on Tuesday.

Find the temperature on Wednesday.

.... °C [2]

(b) Kyra has a faulty thermometer.
It always shows the temperature as $2\,°C$ higher than the actual temperature.
The temperature on the thermometer is $T\,°C$.

Write an expression, in terms of T, for the actual temperature.

.... °C [1]
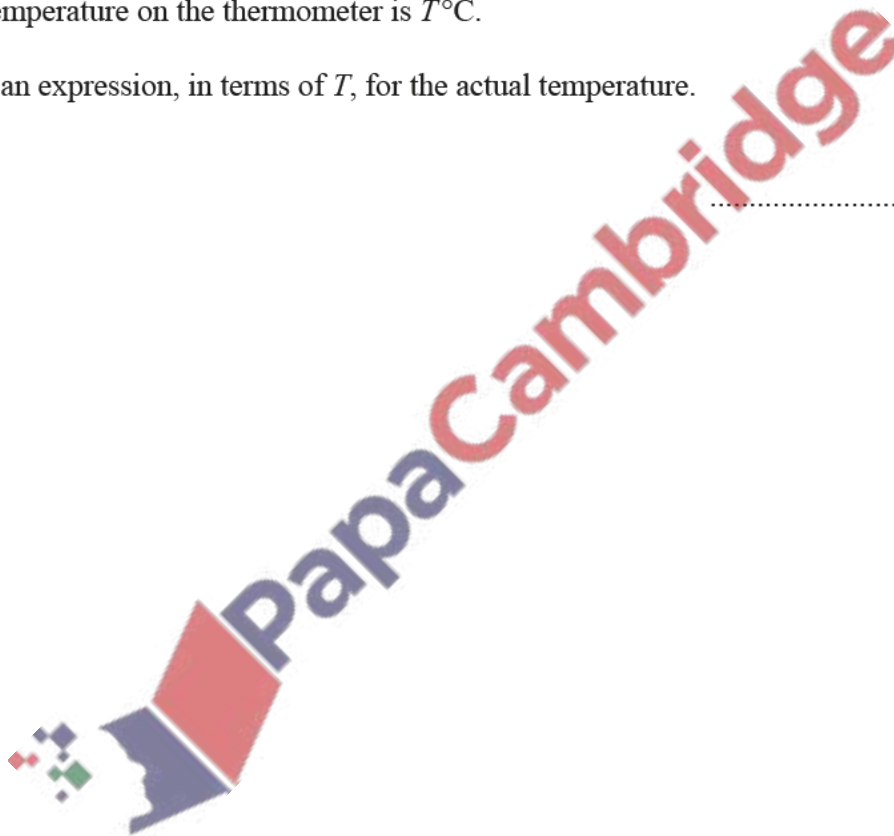
76.

The month of July has 31 days.

Calculate the number of seconds in the month of July.

.... seconds [2]
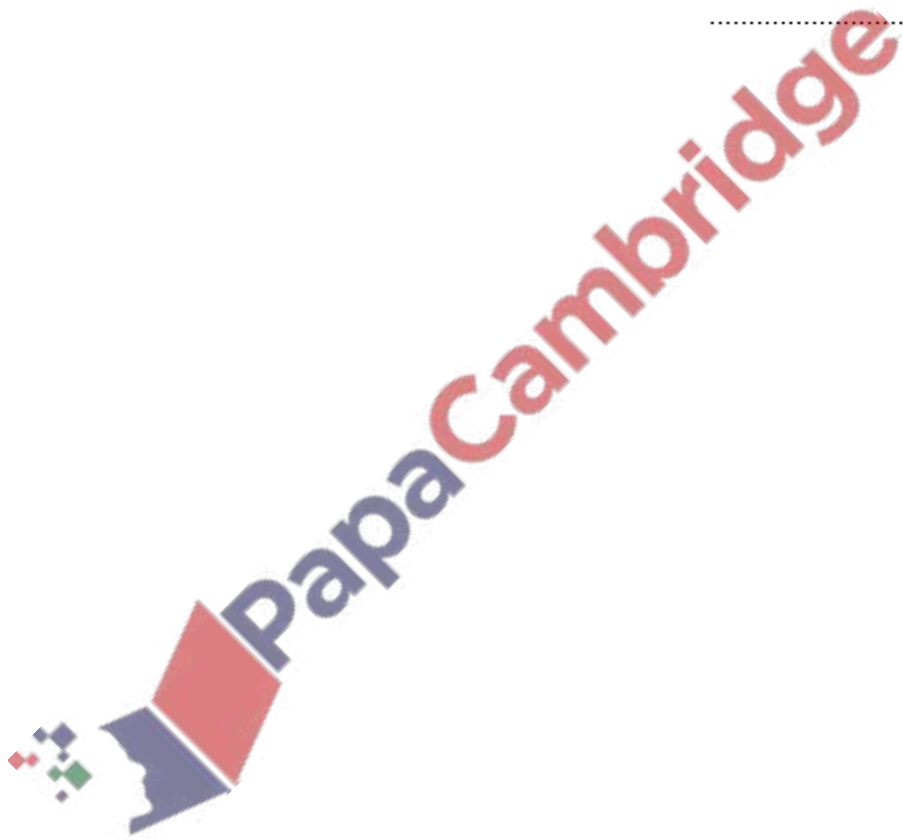
(a) Write down the reciprocal of 40.

.... [1]

(b) Calculate $\sqrt[3]{40}$.
Give your answer correct to 4 decimal places.

.... [2]

(c) Write the number 40 in standard form.

.... [1]
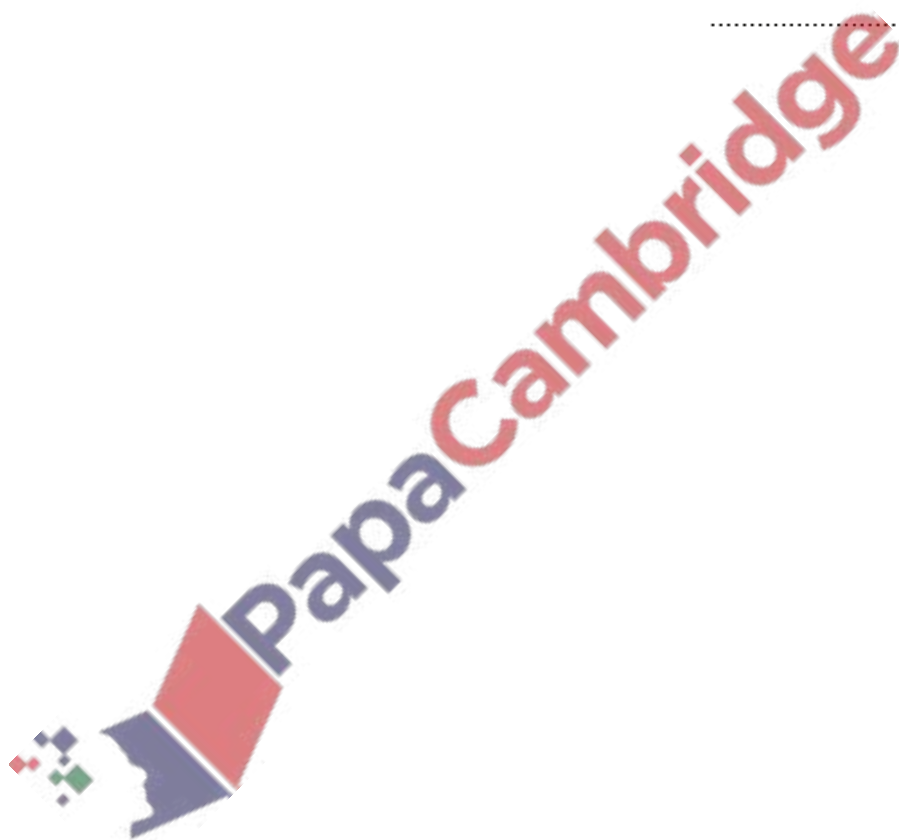
A bag contains red marbles, green marbles and blue marbles only.
The ratio of the number of marbles of each colour is

$$\text{red : green : blue} \;=\; 12 : 5 : 2.$$

There are 112 more red marbles than green marbles.

Work out the number of blue marbles.
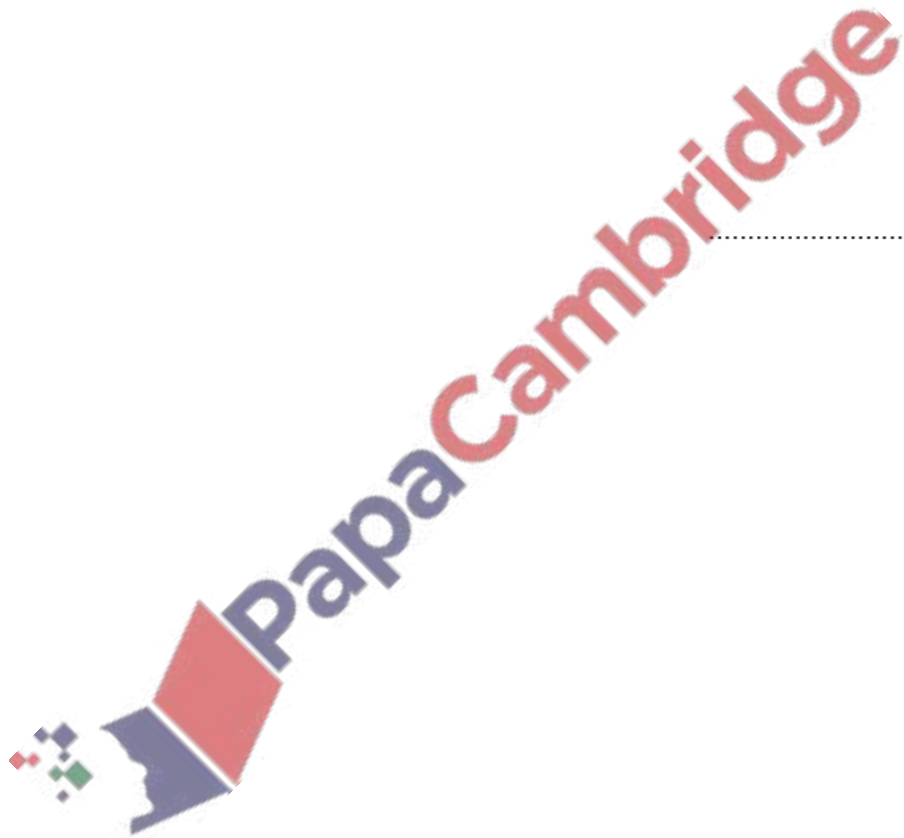
.... [2]

Without using a calculator, work out $\dfrac{15}{28} \div \dfrac{4}{7}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]

$$\dfrac{15}{28} \div \dfrac{4}{7}$$

80.
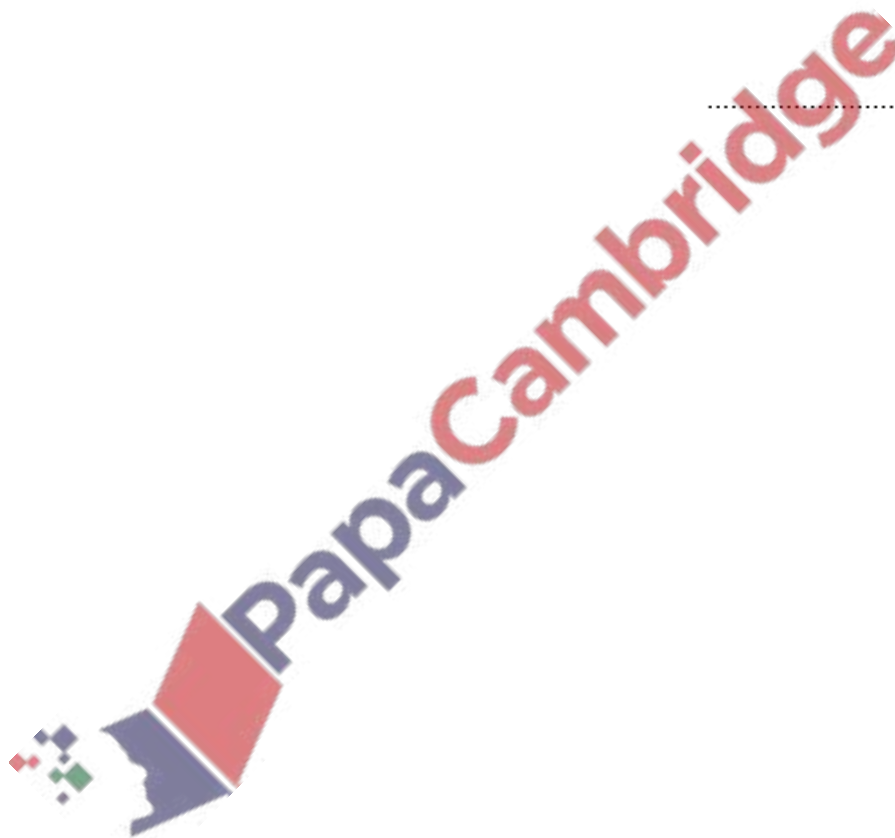
Riya invests $30 000 at a rate of 2.5% per year compound interest.

Calculate the value of her investment at the end of 7 years.
Give your answer correct to the nearest dollar.

$ .... [3]
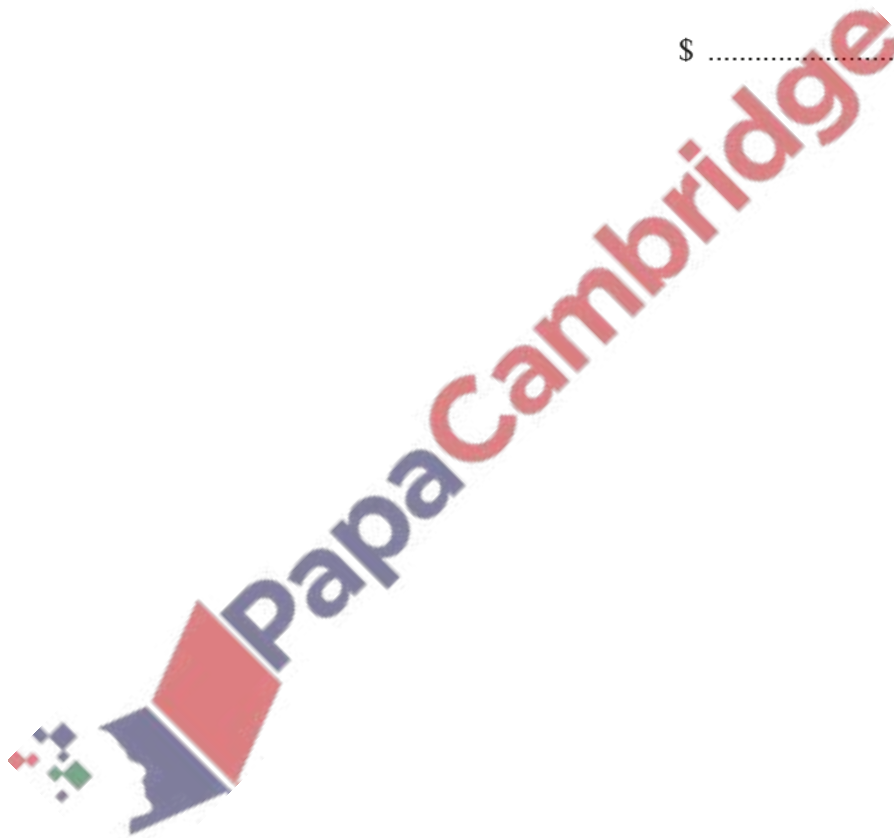
A car travels at a constant speed of 45 kilometres per hour for 5 minutes.
Each wheel of the car has radius 25 centimetres.

Calculate the number of complete revolutions that a wheel makes during the 5 minutes.

.... [5]
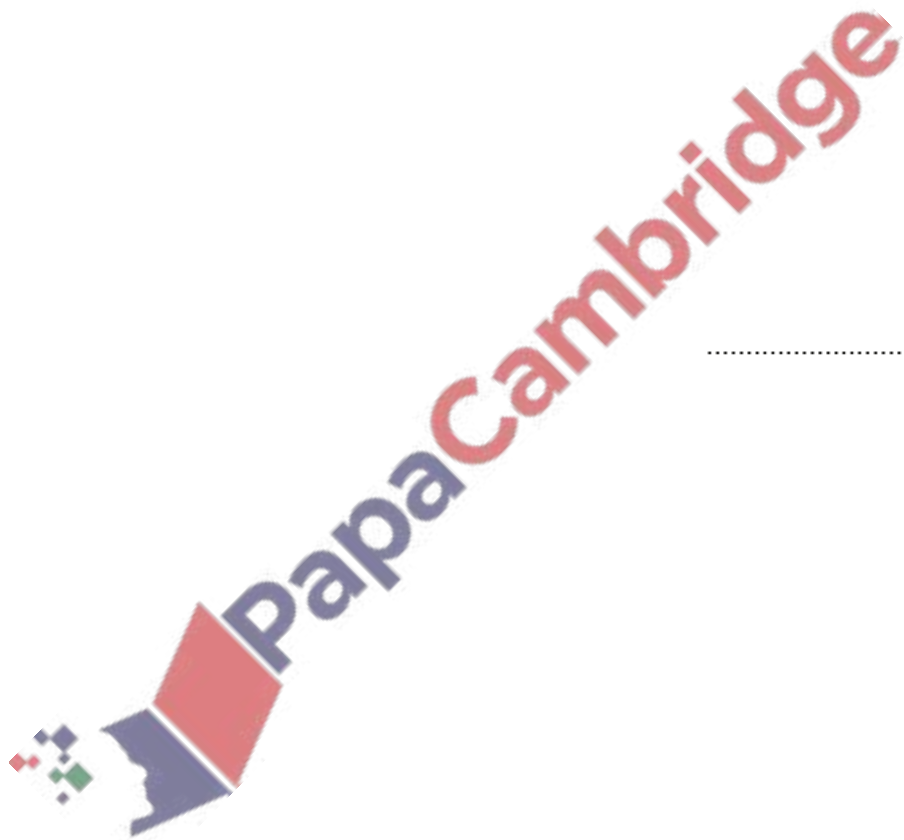
| 3.56 | 5 | $\sqrt{196}$ | 8 | $\sqrt{7}$ | 12 |

From the list, write down a number that is

(a) a multiple of 3,

.... [1]

(b) a cube number,

.... [1]

(c) a prime number,

.... [1]

(d) an irrational number.
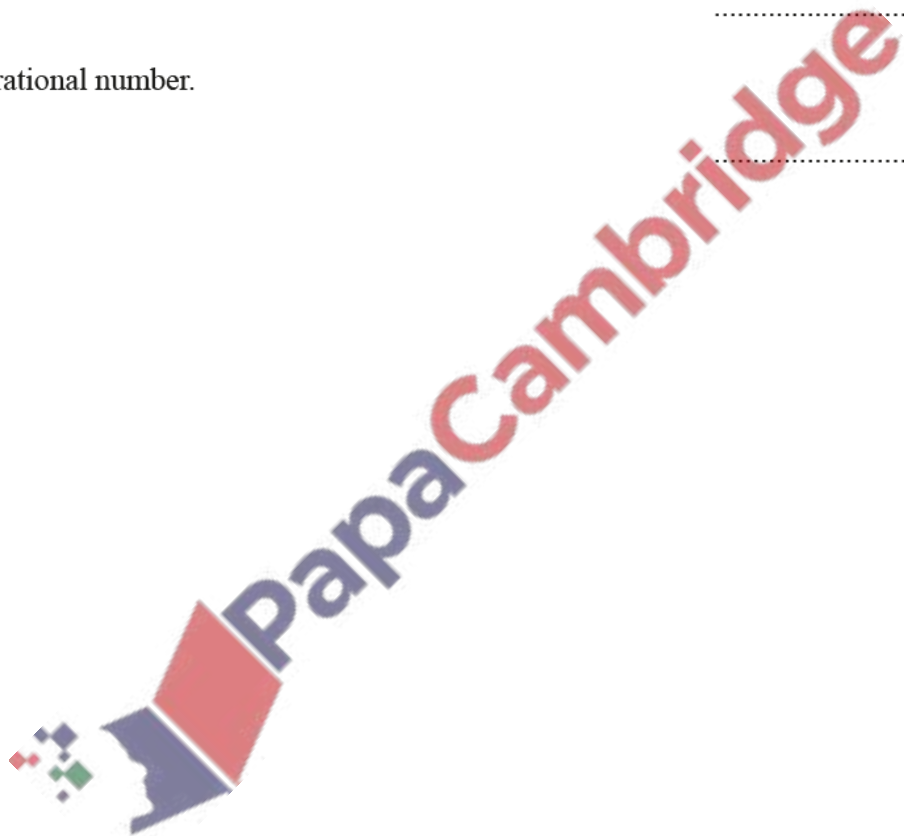
.... [1]

Without using a calculator, work out $\dfrac{15}{28} \div \dfrac{4}{7}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]

84.
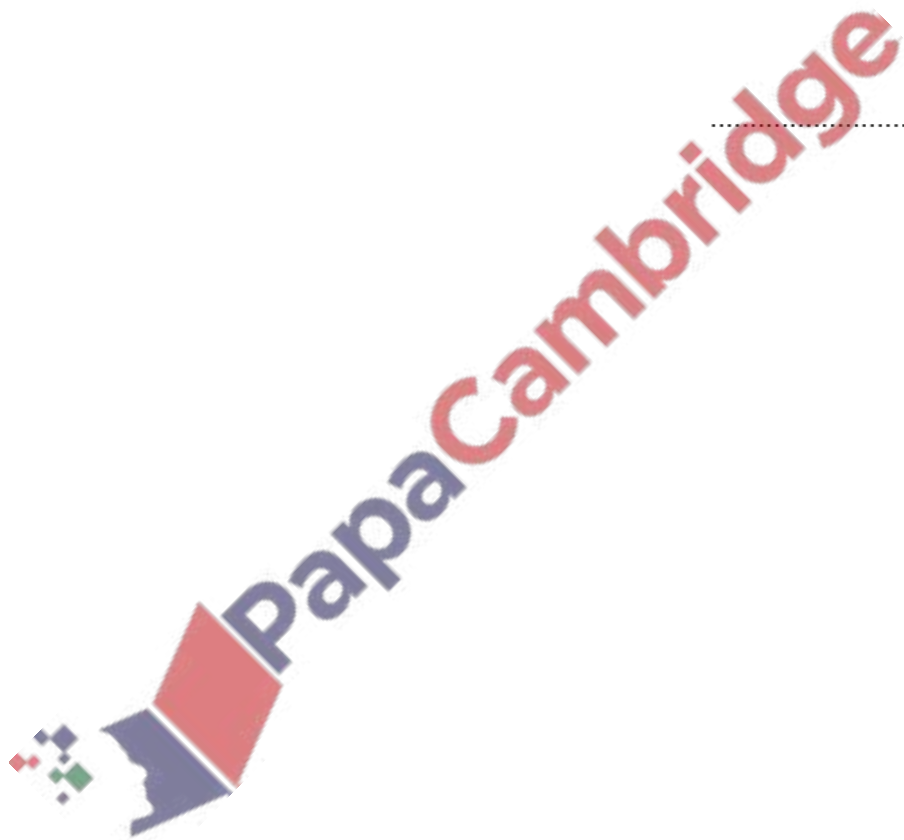
Calculate the value of $(2.3 \times 10^{-3}) + (6.8 \times 10^{-4})$.
Give your answer in standard form.

.... [1]
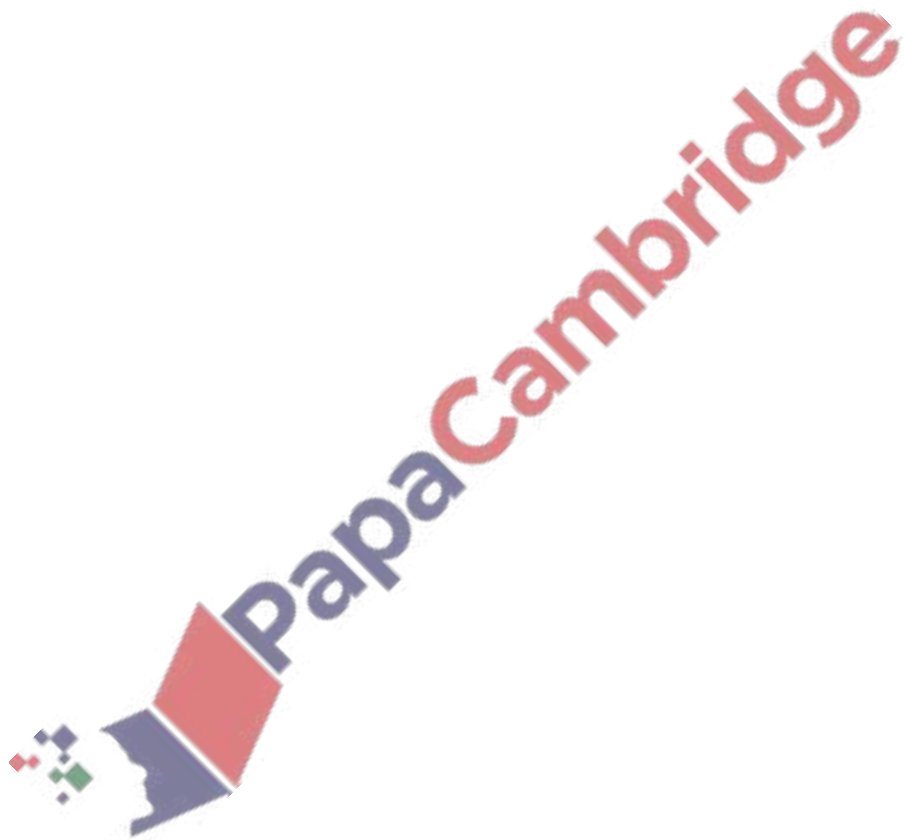
The population of a town decreases exponentially at a rate of 1.7% per year.
The population now is 250 000.

Calculate the population at the end of 5 years.
Give your answer correct to the nearest hundred.
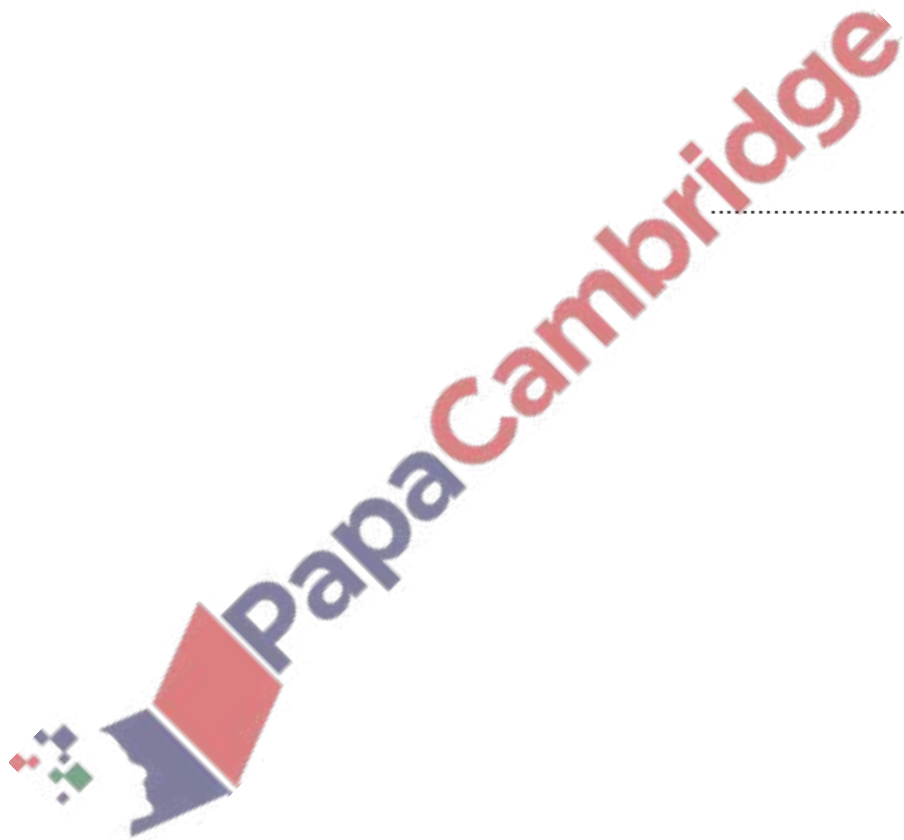
.... [3]

Write the recurring decimal $0.2\dot{6}$ as a fraction.
You must show all your working.

.... [2]
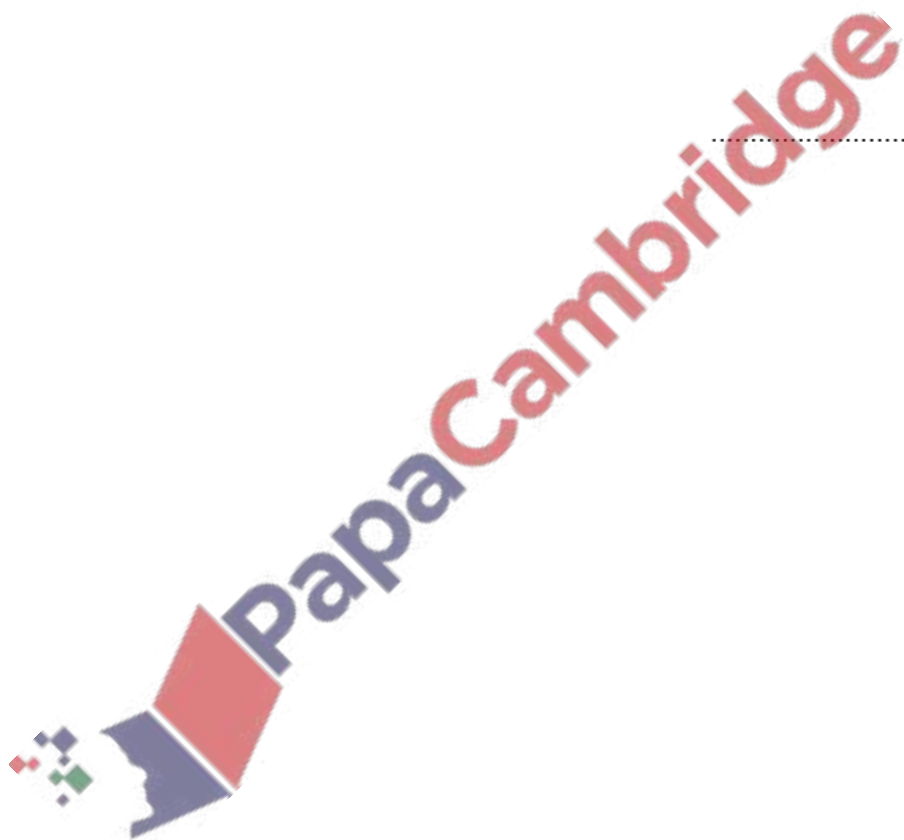
A car travels at a constant speed.
It travels a distance of 146.2 m, correct to 1 decimal place.
This takes 7 seconds, correct to the nearest second.

Calculate the upper bound for the speed of the car.

.... m/s [3]
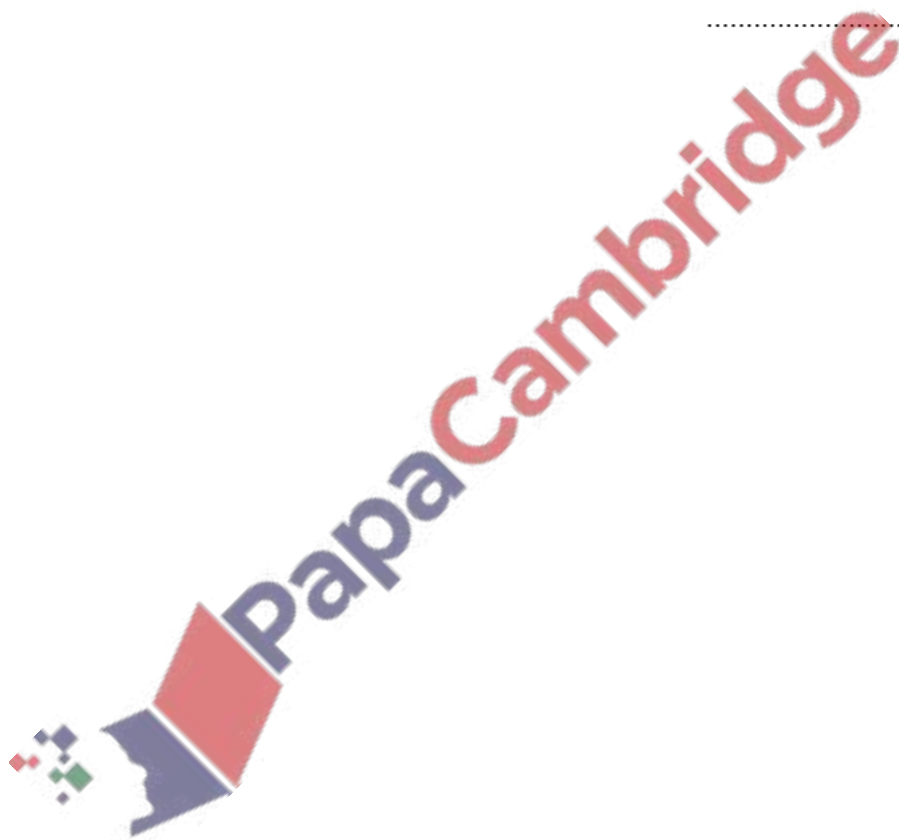
Navja works in a post office.

(a) The table shows the costs of sending parcels by post.
The cost depends on the mass, m grams, of the parcel.

Type of parcel	Mass (g)	Cost ($)
Small	$0 < m \leqslant 60$	0.76
Medium	$60 < m \leqslant 100$	0.95
Large	$100 < m \leqslant 250$	2.20
Extra large	$250 < m \leqslant 1000$	5.60

(i) Sai sends each of these four parcels by post.

55 g   0.3 kg   875 g   250 g
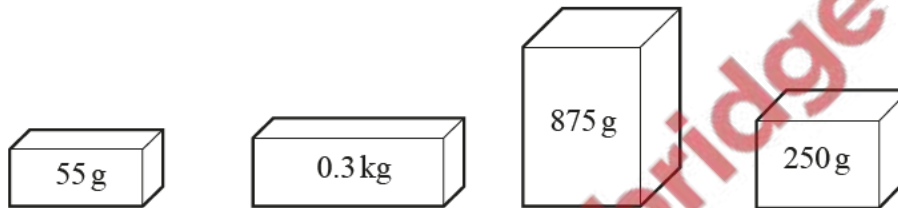
He pays with a $20 note.

Work out how much change he receives.

$ .... [4]

(ii) On 1 April, the cost of sending any parcel increases by 5%.

(a) Show that the increase in the cost of sending an **Extra large** parcel is $0.28 .

[1]

(b) Avani says

> "As the cost of an **Extra large** parcel increases by \$0.28 then the cost of a **Large** parcel will also increase by \$0.28 to \$2.48."

Explain why Avani is incorrect.

....

.... [1]

(b) (i) Navja weighs a parcel with mass w kg on her scales.
She uses the masses shown to balance the scales.
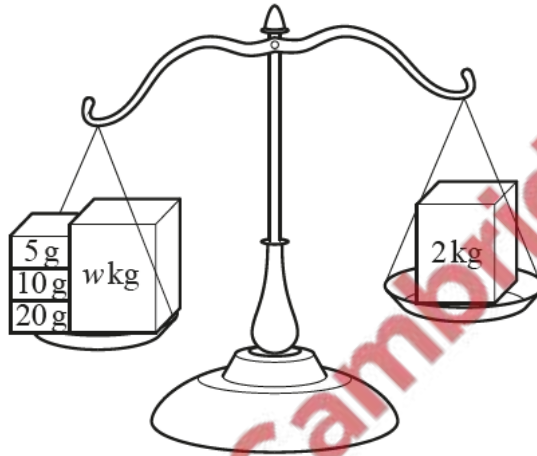
Work out the value of w.

$w =$ .... [3]

(ii) Sometimes Navja uses an electronic weighing machine.
The machine gives the mass, p kg, of a parcel as 12.4 kg, correct to the nearest 100 g.

Complete this statement about the value of p.

.... $\leqslant p <$ .... [2]

(b) The attendance at a football match is 11 678.

(i) Write 11 678 in words.

.... [1]

(ii) Write 11 678 correct to the nearest 100.

.... [1]

(c) In a football stadium there are 15 000 seats.
10 650 of these seats are occupied.

Find the percentage of the 15 000 seats that are occupied.

.... % [1]

(d) A ticket to a football match costs $20.

Calculate the cost of the ticket in rupees when the exchange rate is 1 rupee = $0.016 .

.... rupees [2]

(a) $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$
$F = \{x: x \text{ is a factor of } 14\}$
$P = \{x: x \text{ is a prime number less than } 14\}$

(i) Write down the elements in set F.

$F = \{$ .... $\}$ [2]

(ii) Write down the elements in set P.

$P = \{$ .... $\}$ [2]

(iii)

(a) Complete the Venn diagram.

[2]

102
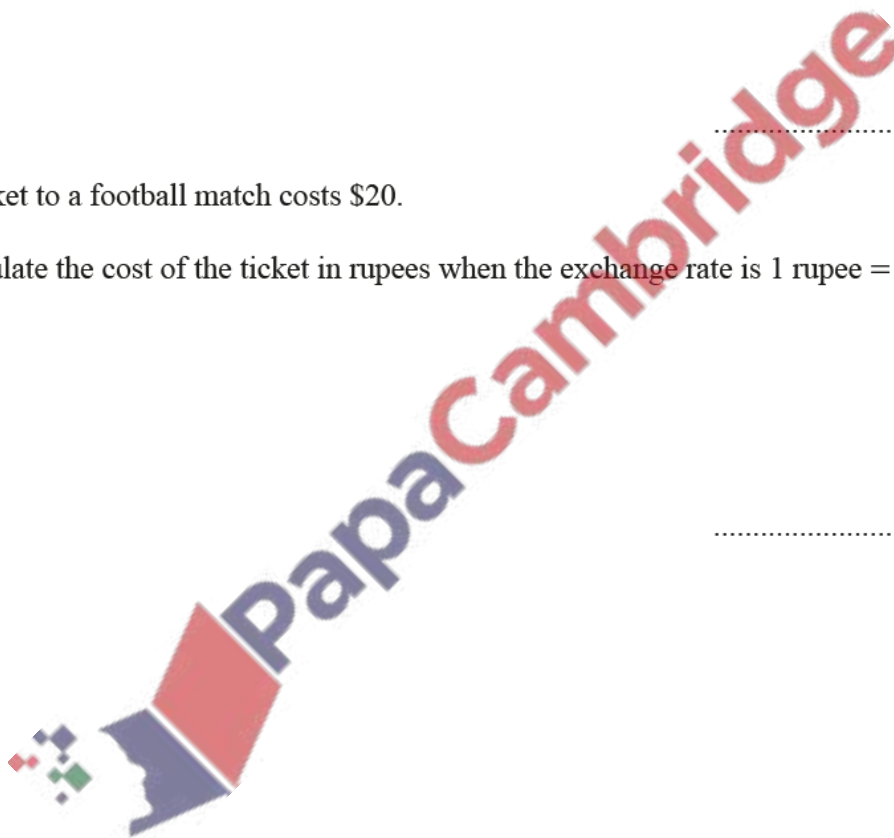
(b) Write down n$(F \cap P)$.

.... [1]

(c) A number is chosen at random from the universal set $\mathcal{E}$.

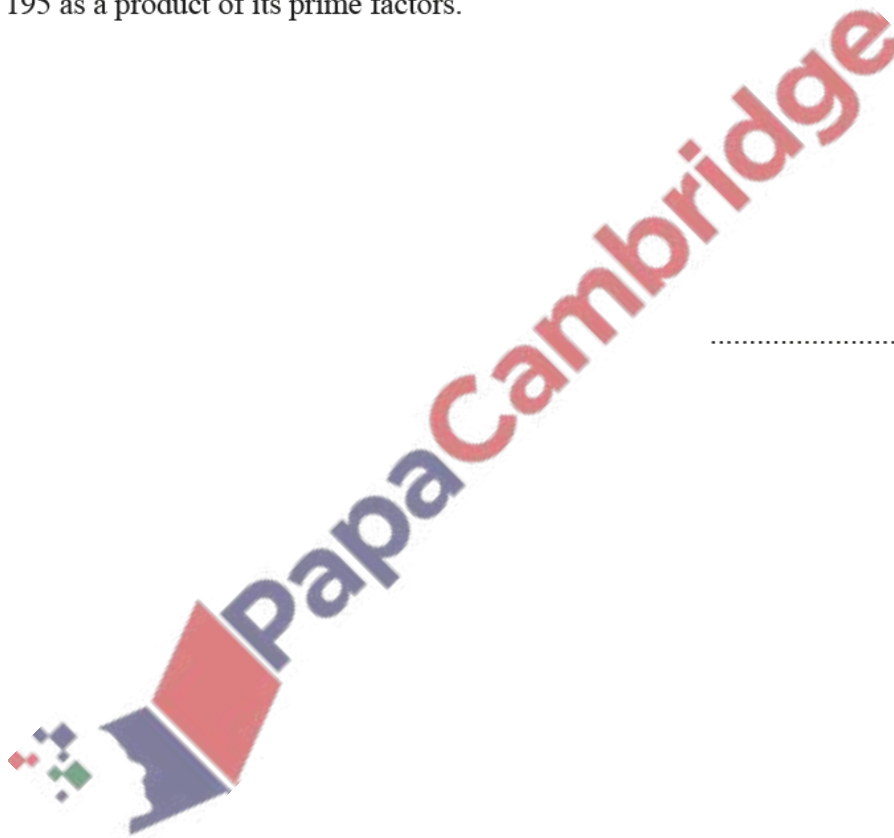Write down the probability that the number is in the set $F \cup P$.

.... [2]

(b) Write 195 as a product of its prime factors.

.... [2]

Dhanu has a model railway.

(a) He has a train that consists of a locomotive and 4 coaches.
The mass of the locomotive is 87 g and the mass of each coach is 52 g.

(i) Work out the total mass of the train.

.... g [2]

(ii) Work out the mass of the locomotive as a percentage of the total mass of the train.

.... % [1]

(b) The train is 61 cm long and travels at a speed of 18 cm/s.
It takes 4 seconds for the whole of the train to cross a bridge.

Calculate the length of the bridge.

.... cm [2]

(c) A new locomotive costs $64.

Calculate the cost of the locomotive in rupees when the exchange rate is 1 rupee = $0.0154 .
Give your answer correct to the nearest 10 rupees.

.... rupees [2]

(d) The cost of a railway magazine increases by 12.5% to $2.70 .

Calculate the cost of the magazine before this increase.

$ .... [2]

(e) Dhanu plays with his model railway from 06 50 to 11 15.
He then rides his bicycle for 3 hours.

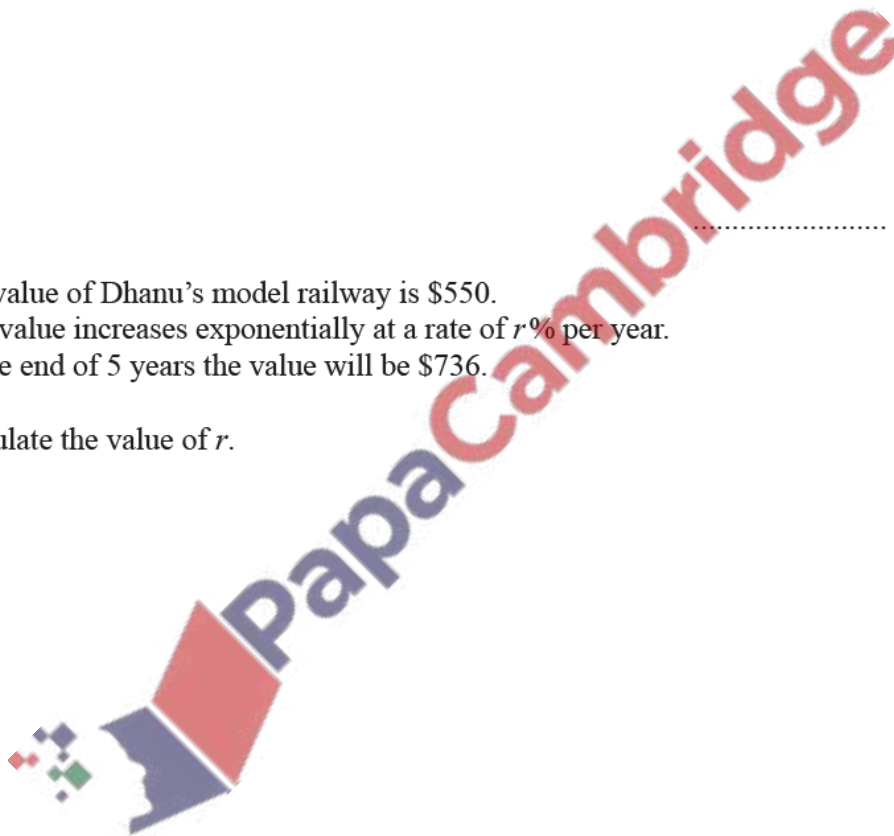Find the ratio   time playing with model railway : time riding bicycle.
Give your answer in its simplest form.

.... : .... [3]

(f) The value of Dhanu's model railway is $550.
This value increases exponentially at a rate of $r\%$ per year.
At the end of 5 years the value will be $736.

Calculate the value of r.

$r =$ .... [3]

(a) Manjeet uses 220 litres of water each day.
She reduces the amount of water she uses by 15%.

Calculate the number of litres of water she now uses each day.

.... litres [2]

(b) Manjeet has two mathematically similar bottles in her bathroom.
The large bottle holds 1.35 litres and is 29.7 cm high.
The small bottle holds 0.4 litres.

Calculate the height of the small bottle.

.... cm [3]

(c) Water from Manjeet's shower flows at a rate of 12 litres per minute.
The water from the shower flows into a tank that is a cuboid of length 90 cm and width 75 cm.

Calculate the increase in the level of water in the tank when the shower is used for 7 minutes.

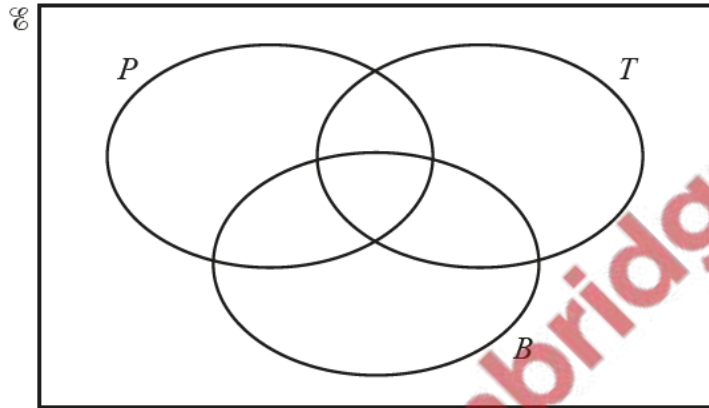... cm [3]

This year, 40 students have each travelled by one or more of plane (P), train (T) or boat (B).

- 7 have travelled only by plane.
- 11 have travelled only by train.
- 9 have travelled only by boat.

$$n(P \cap T) = 8$$
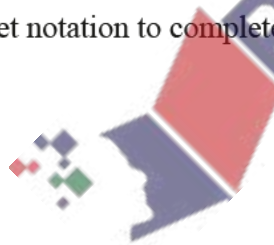$$n(B \cap T) = 3$$
$$n(B \cap P) = 6$$

(a) Complete the Venn diagram. [3]

(b) Find $n\big((P \cup B)'\big)$.

.... [1]

(c) Use set notation to complete the statement.

$$(P \cup T \cup B)' = \text{..........................}$$ [1]

(d) Two students are chosen at random.

Calculate the probability that they both have travelled only by plane.

.... [2]

(e) Two students are chosen at random from those who have travelled by train.

Calculate the probability that they both have also travelled by plane.
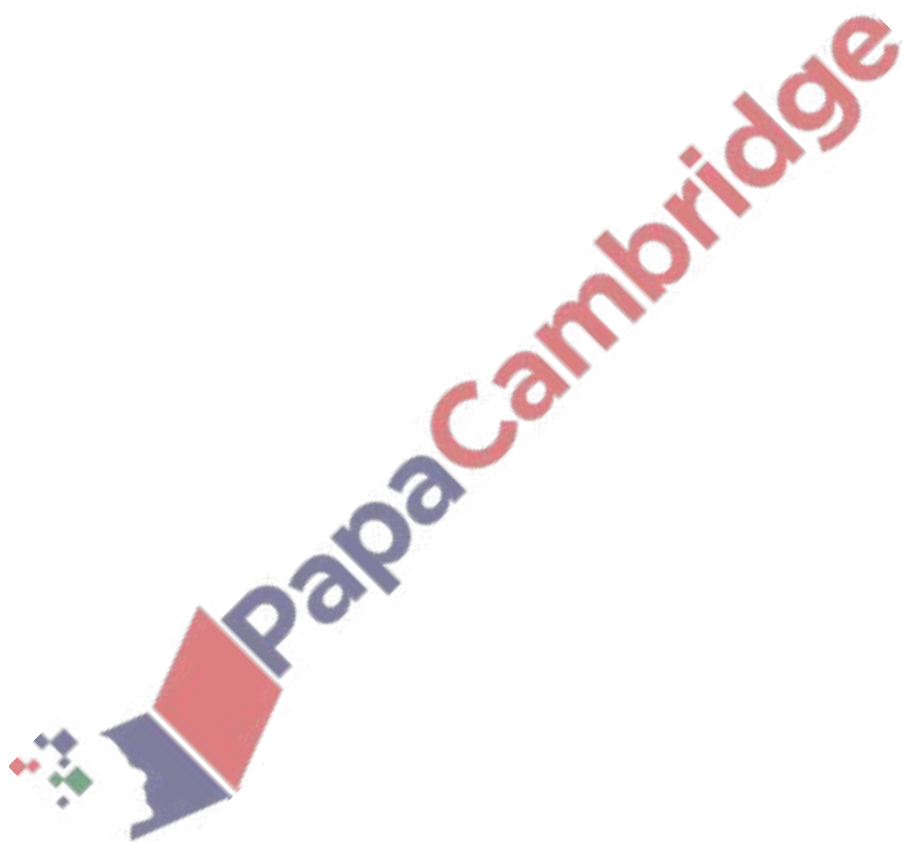
.... [2]

94.
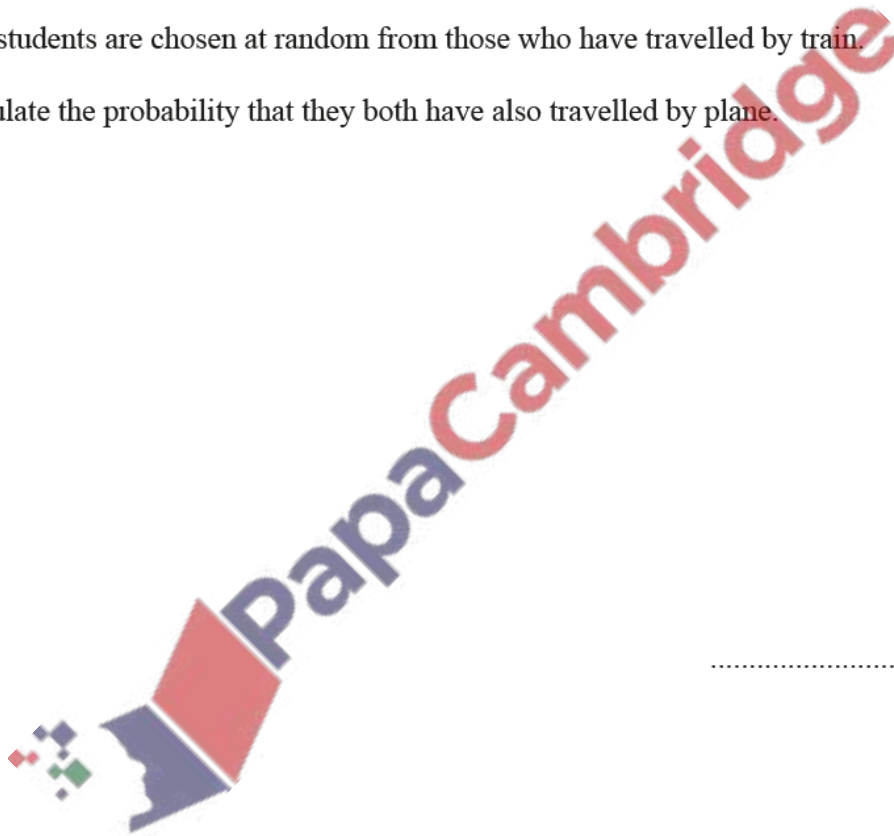
Write down the value of the 7 in the number 570 296.

.... [1]

Write these numbers in order, starting with the smallest.

$\dfrac{13}{201}$ 5.6%   0.065 $\dfrac{5}{89}$

.... < .... < .... < .... [2]
smallest
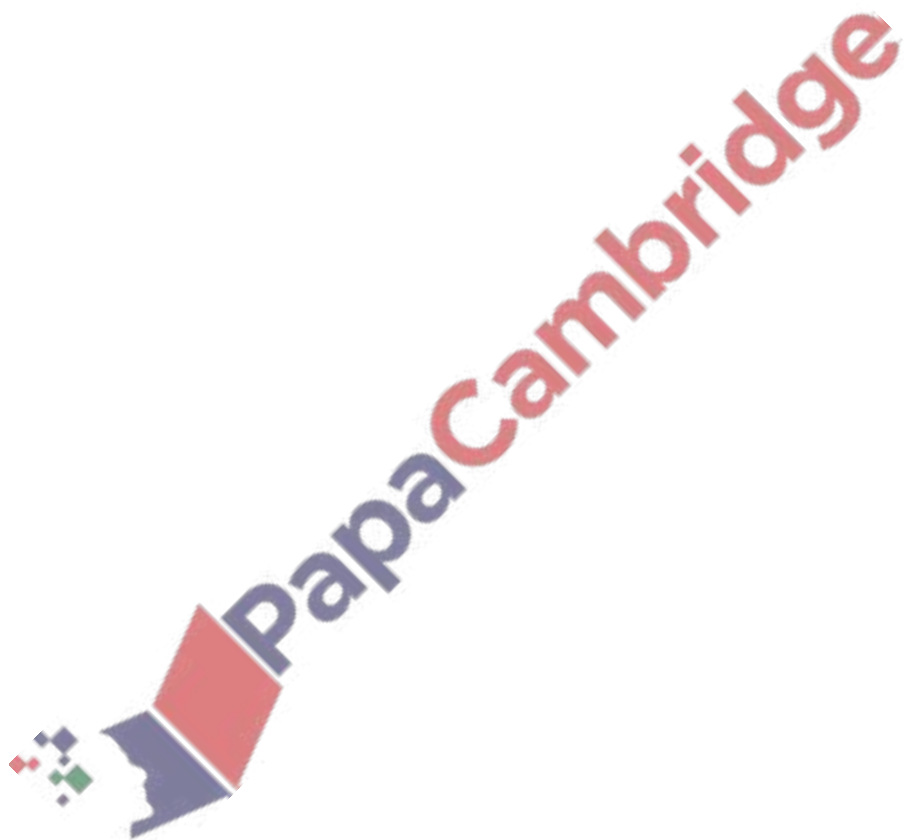
(a) Diego flies from Madrid to Buenos Aires.
His flight leaves at 20 55 and arrives at 03 50 local time.
The local time in Buenos Aires is 5 hours behind the local time in Madrid.

Work out, in hours and minutes, the time the flight takes.

.... h .... min [2]

(b) Diego changes 200 euros into Argentine Peso.
The exchange rate is 1 euro = 24.8 pesos.

Work out how many pesos he receives.

.... pesos [1]

(c) The distance between Madrid and Buenos Aires is 10 050 km.
Diego's return flight takes 12 hours 30 minutes.

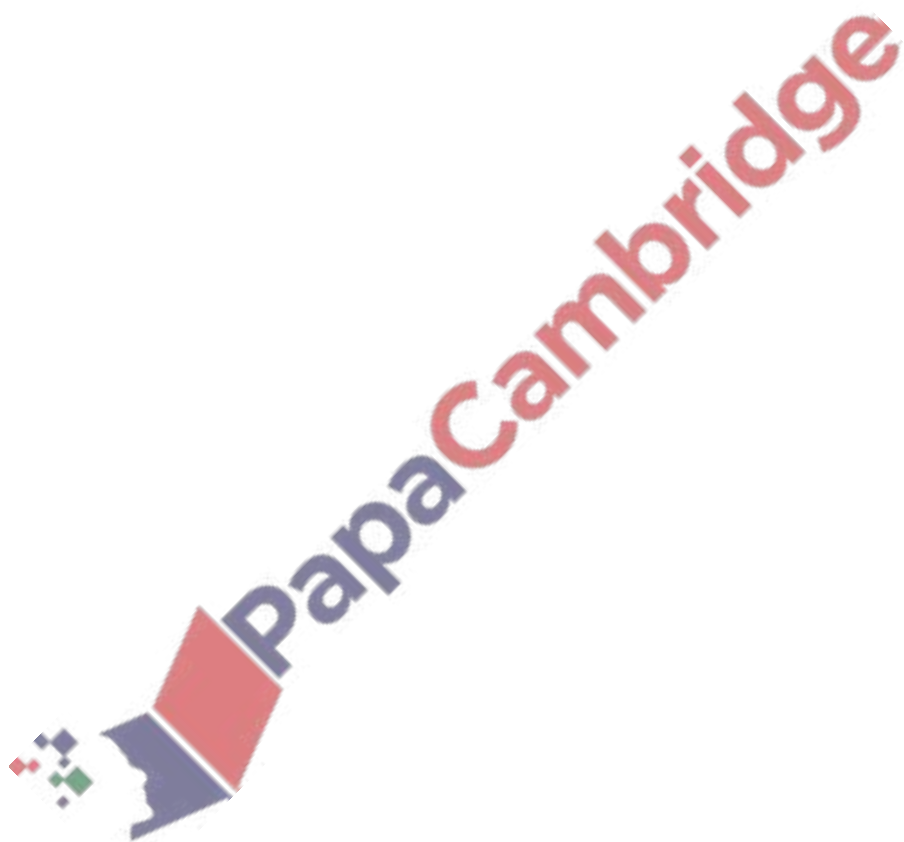Calculate the average speed, in km/h, for the return flight.

.... km/h [1]
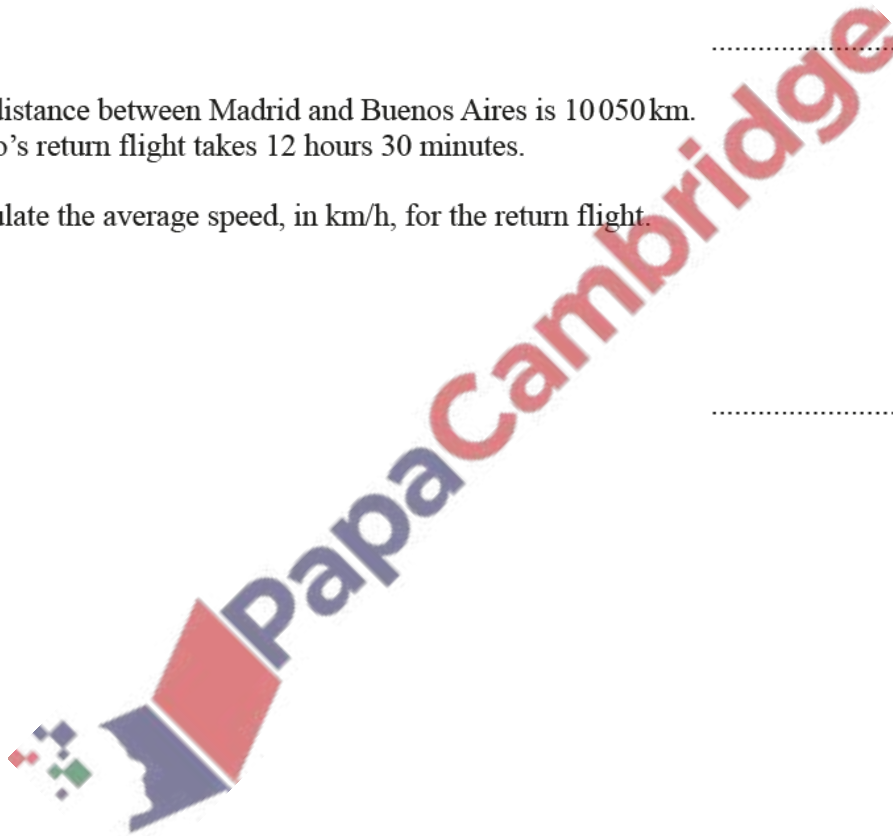
Find the highest **odd** number that is a factor of 60 and a factor of 90.

.... [1]

(a) Write the number 0.0605 in standard form.

.... [1]

(b) Calculate $(1.63 \times 10^{12}) \times (2.47 \times 10^{-1})$.
Give your answer in standard form.

.... [1]
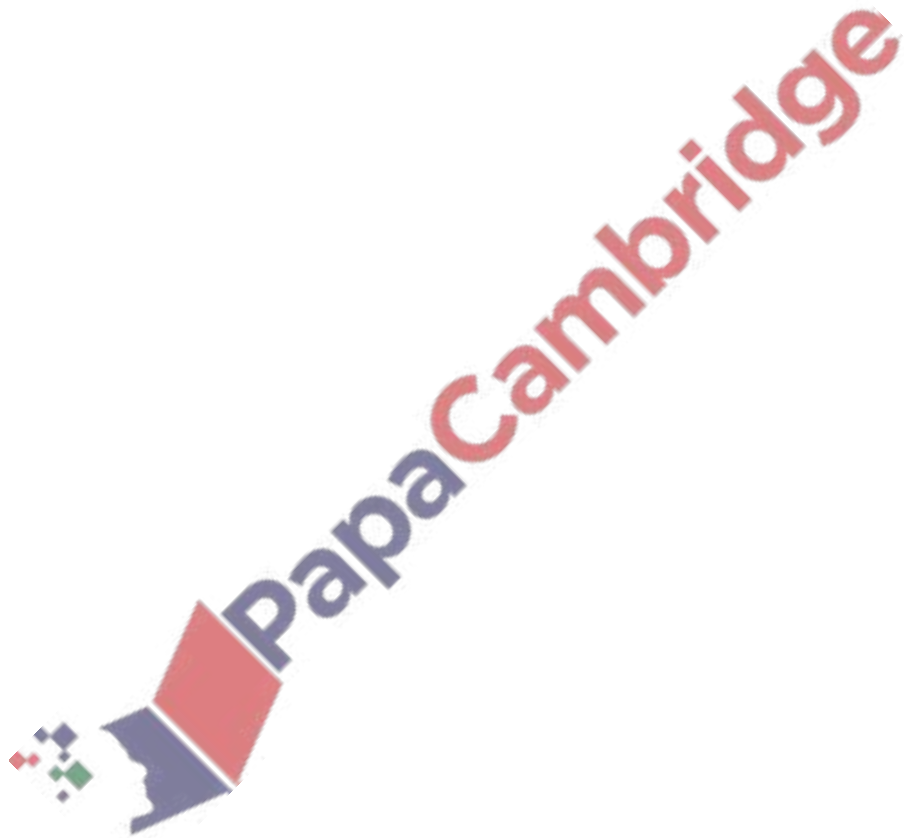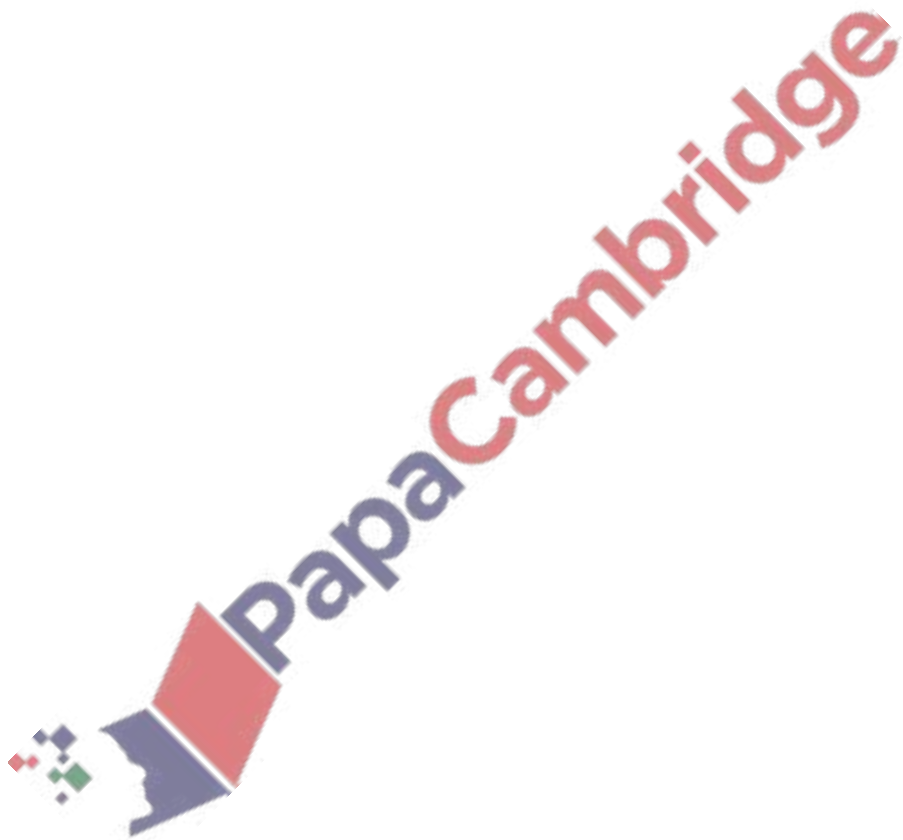
The length, l cm, of a sheet of paper is 29.7 cm, correct to the nearest millimetre.

Complete this statement about the value of l.

.... $\leqslant l <$ .... [2]
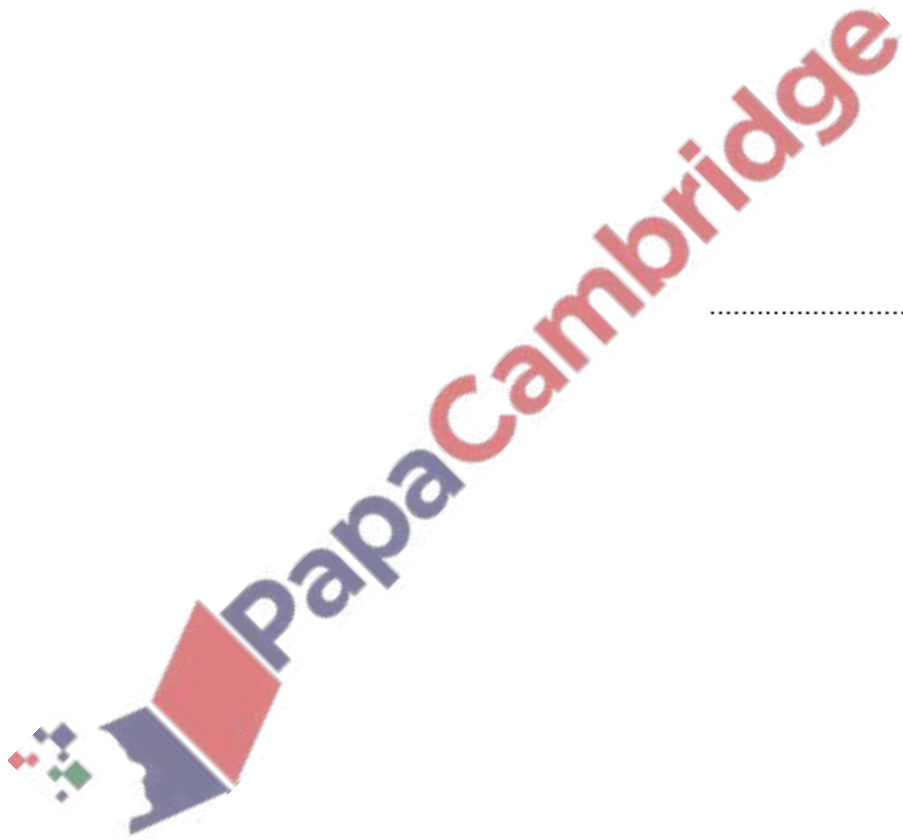
Without using a calculator, work out $\left(2\frac{1}{3} - \frac{7}{8}\right) \times \frac{6}{25}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [4]

101.

(a) Write in figures the number fifty-three thousand and thirty-five.

.... [1]

(b) Write 8379 correct to the nearest hundred.

.... [1]

102.
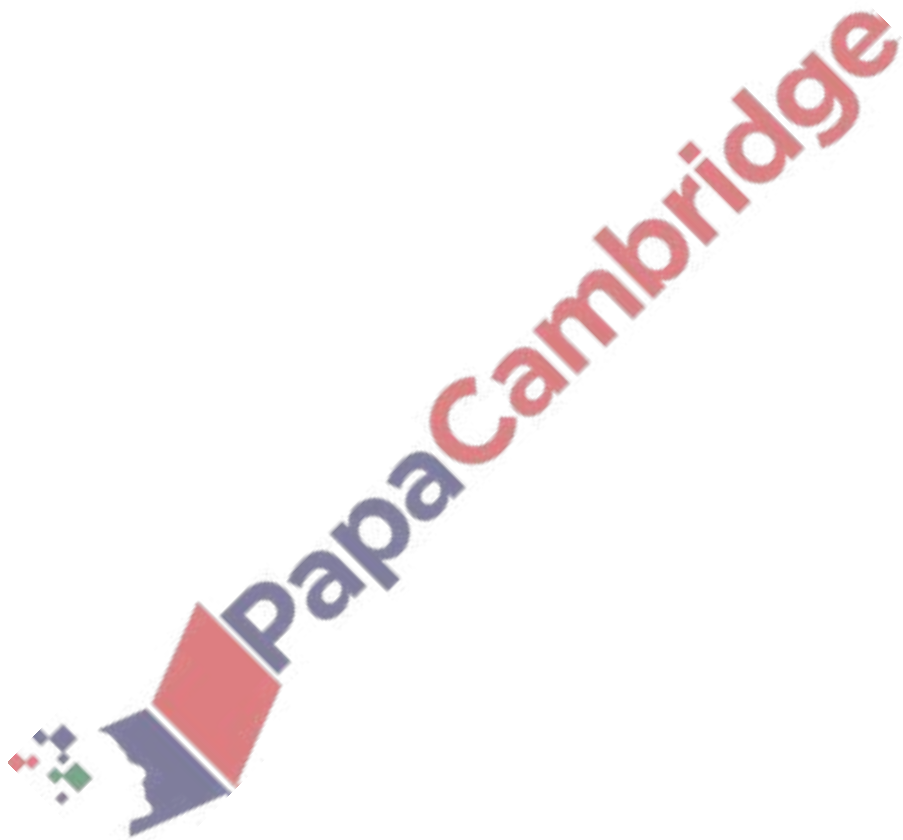
(a) Find the value of $\sqrt{196}$.

.... [1]

(b) Calculate 15^3.

.... [1]

103.

Put one pair of brackets in each statement to make it correct.

(a) $16 \div 8 + 4 \times 2 = 1$ [1]

(b) $16 \div 8 + 4 \times 2 = 12$ [1]

104.

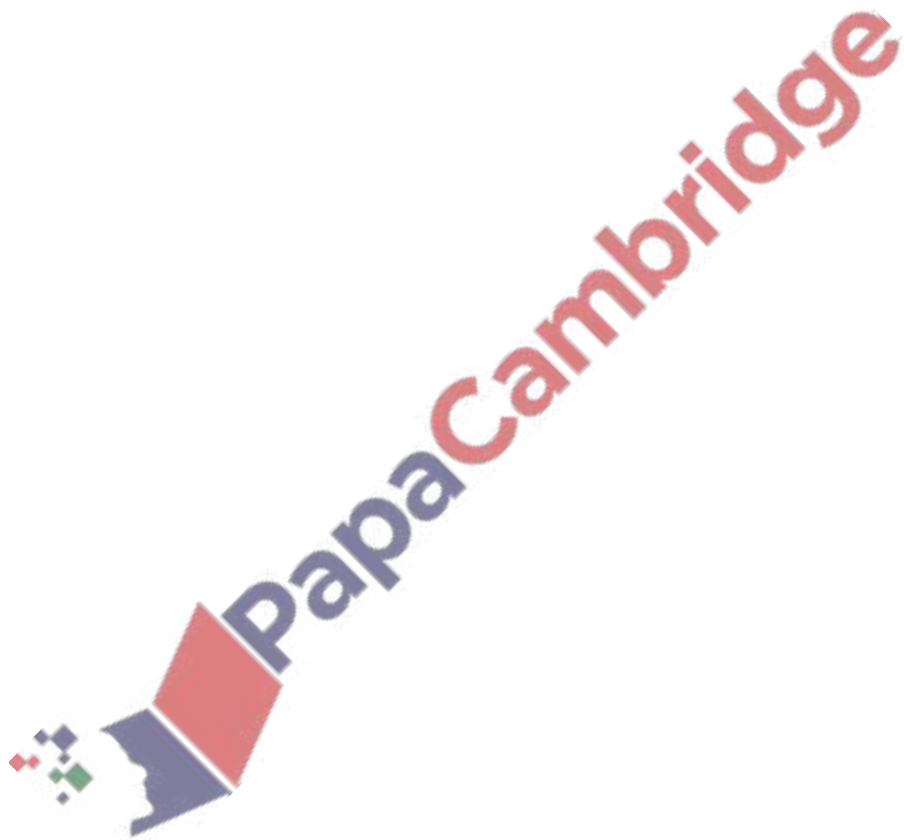Change 5.3 kilometres into metres.

.... m [1]
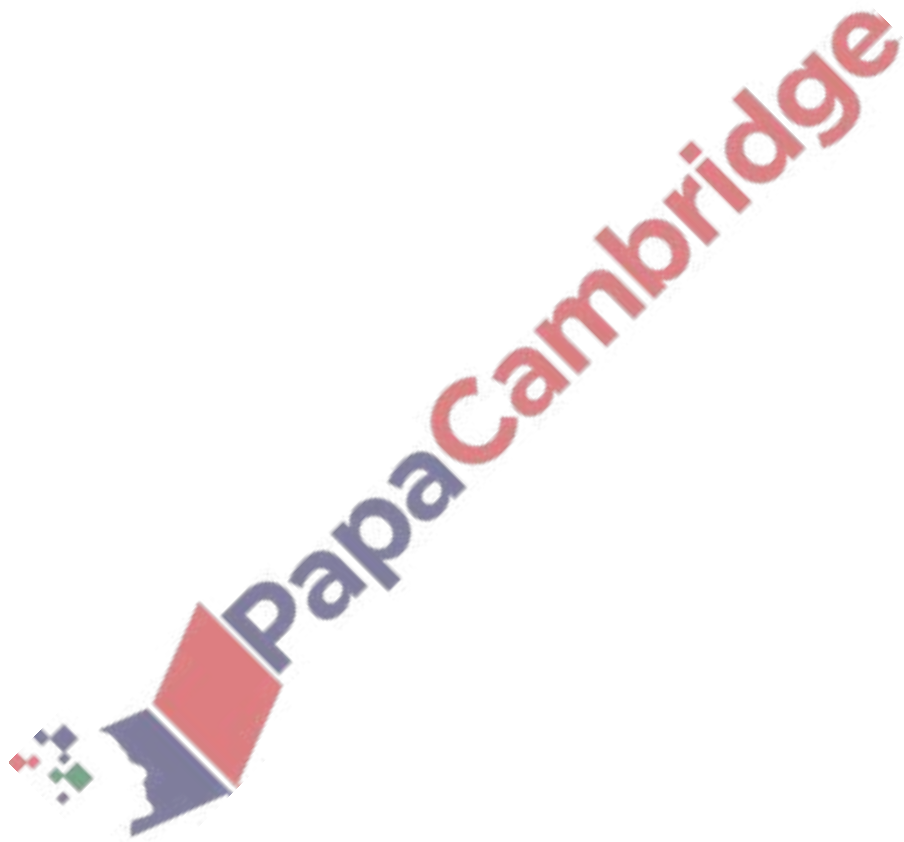
Write down

(a) a square number greater than 10,

.... [1]

(b) an irrational number.

.... [1]
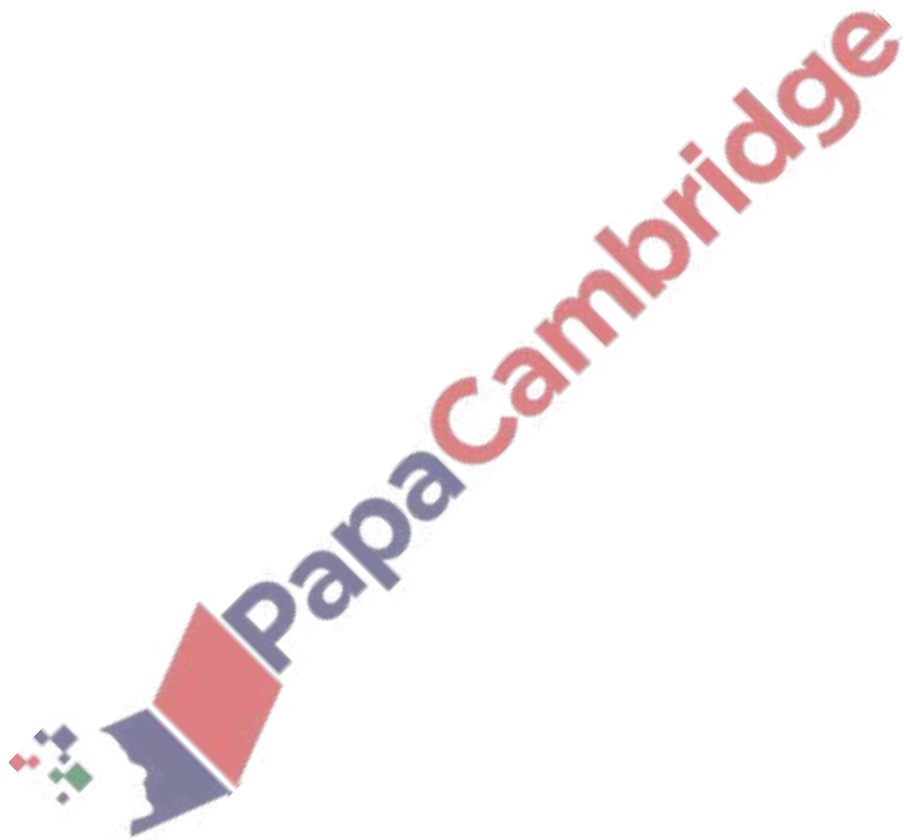
The height, h metres, of a tower is $76.3\,\text{m}$, correct to 1 decimal place.

Complete this statement about the value of h.

.... $\leqslant h <$ .... [2]

Rovers, United and City are football teams.

Rovers scored x goals.
United scored 8 goals more than Rovers.
City scored 3 goals less than twice the number of goals scored by Rovers.

The three teams scored a total of 117 goals.

Write down and solve an equation to find the value of x.
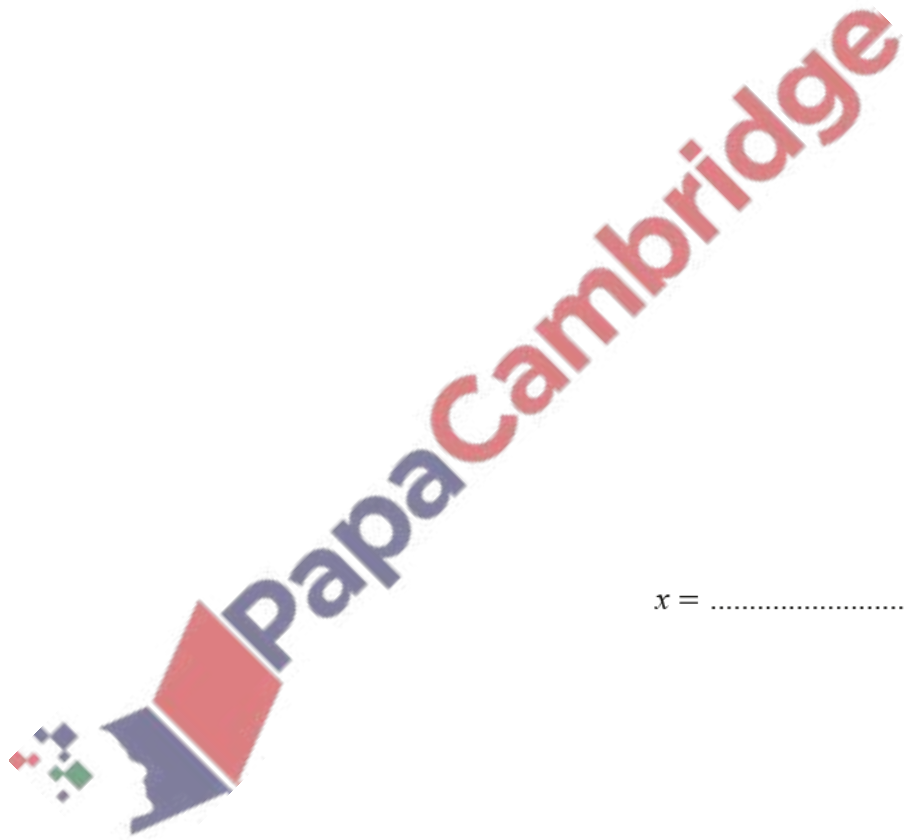
$x =$ .... [4]

(a)
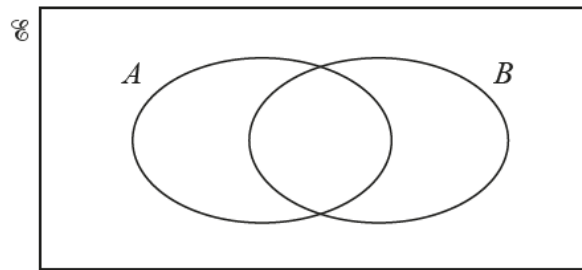
On the Venn diagram, shade the region $A \cap B$.   [1]

(b) $\mathcal{E} = \{1, 2, 3, 4, 5, 6\}$
        $P = \{x : x \text{ is an even number}\}$
        $Q = \{x : x \text{ is a prime number}\}$
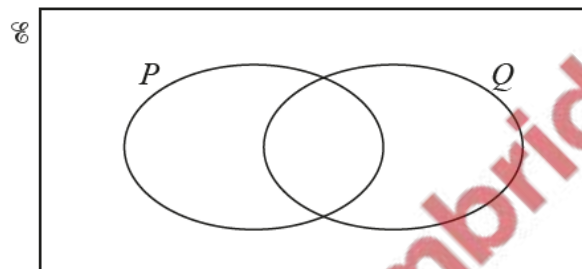
Complete the Venn diagram.   [2]
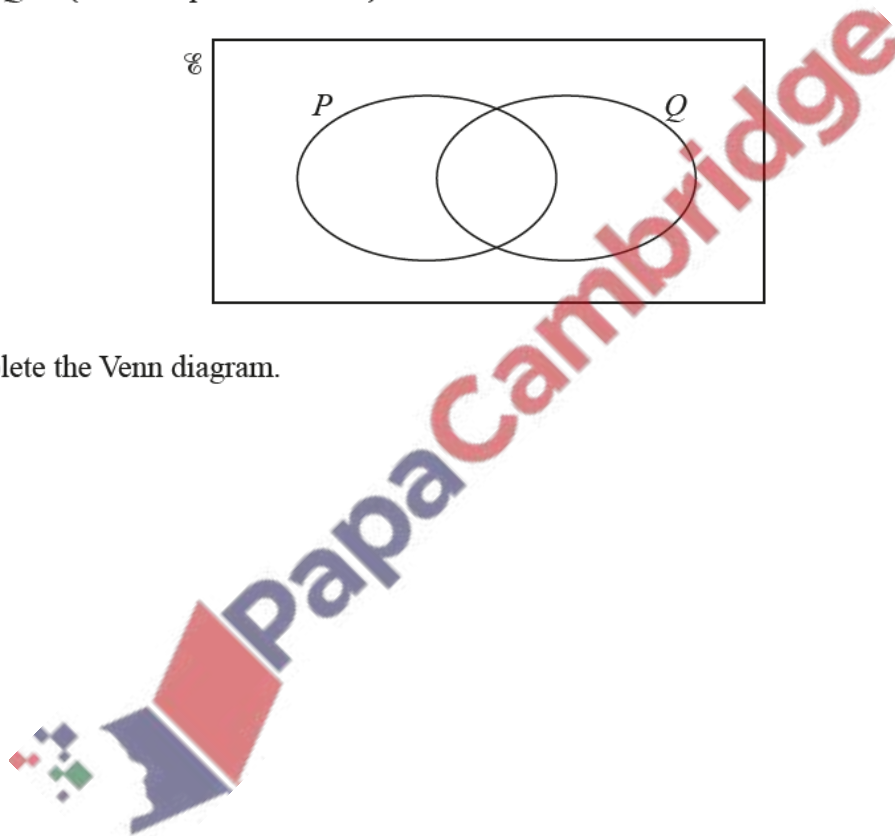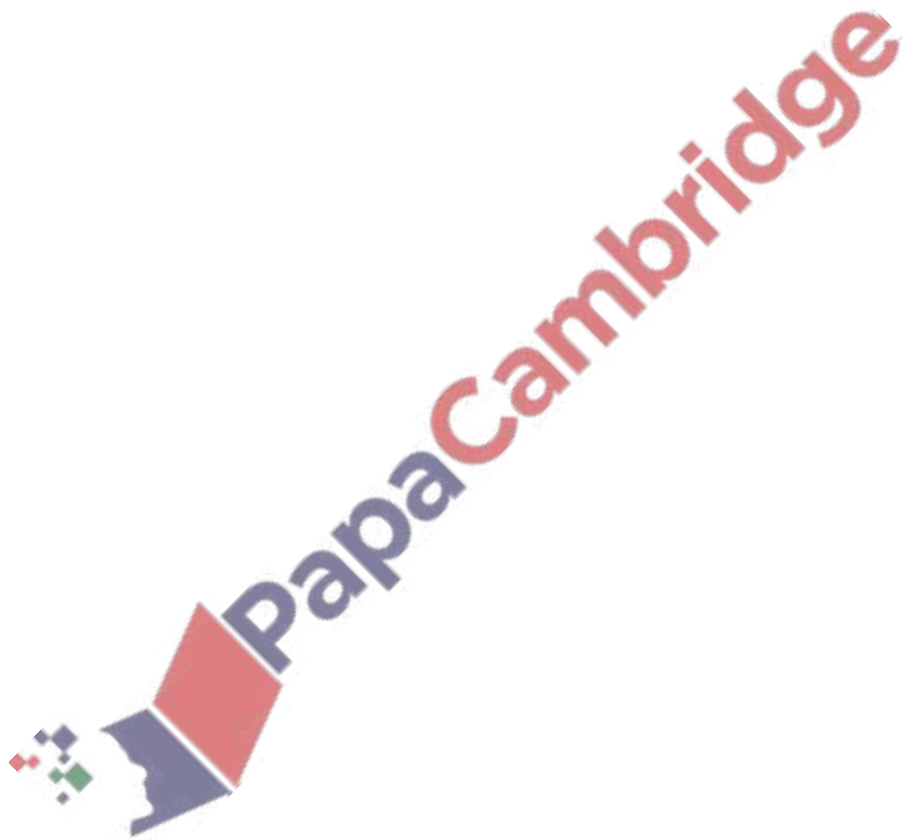
109.

Write 2^{-4} as a decimal.

.... [1]

Without using a calculator, work out $1\frac{3}{4} - \frac{11}{12}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]
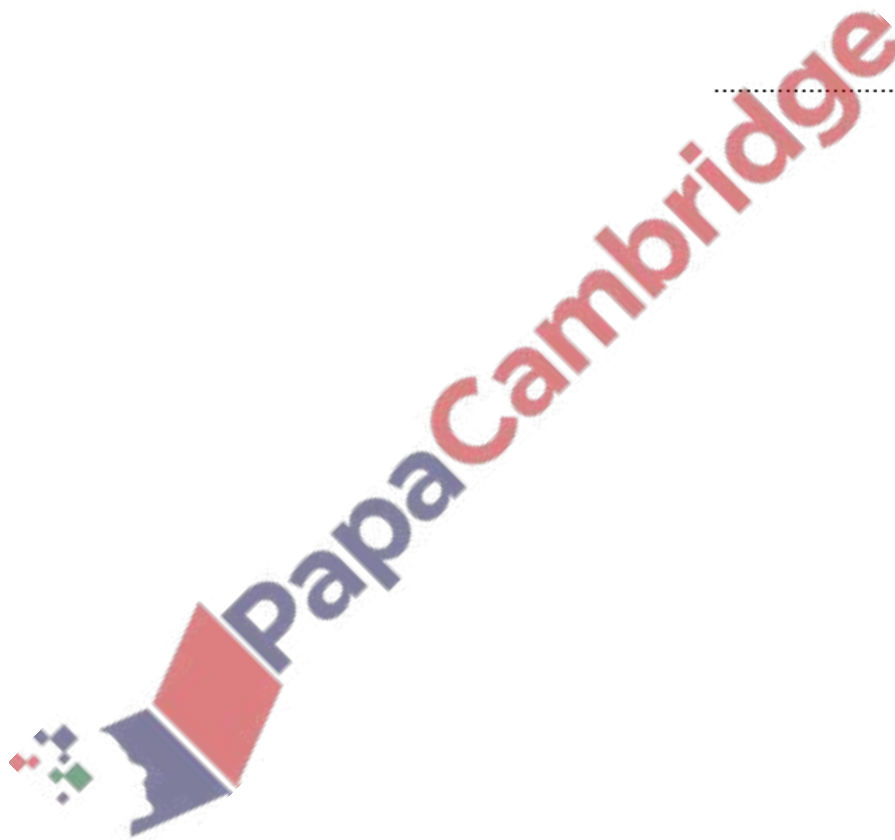
Roberto buys a toy for \$5.00 .
He then sells it for \$4.60 .

Calculate his percentage loss.

.... % [2]

112.
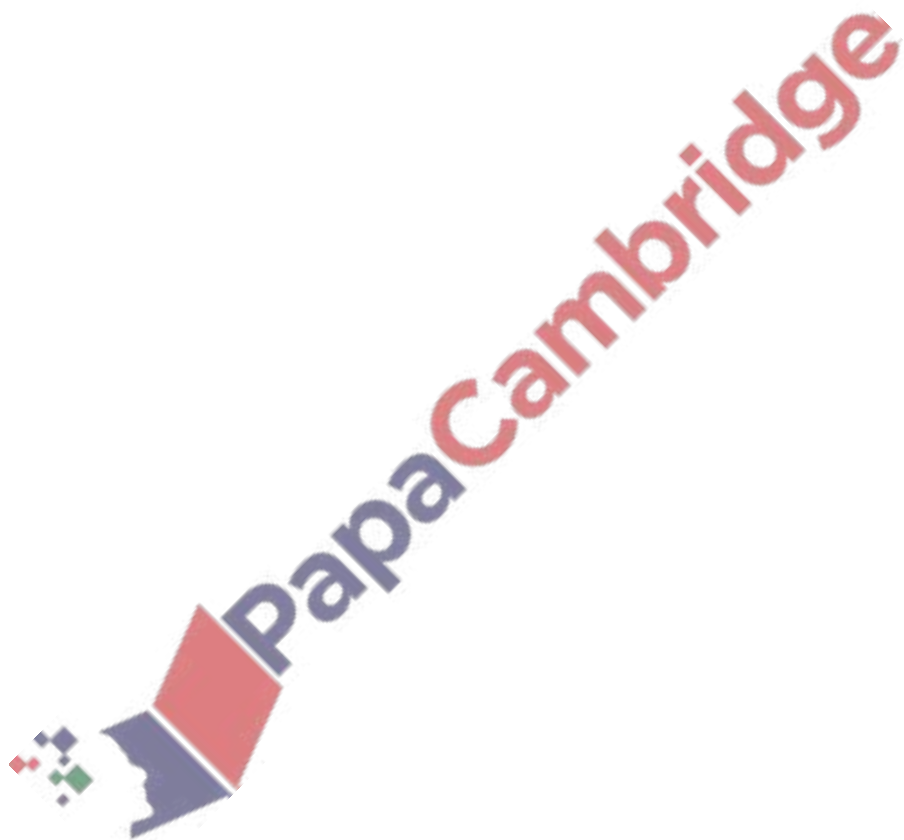
(a) Write 45 000 in standard form.

.... [1]

(b) Write 2.06×10^{-2} as an ordinary number.

.... [1]
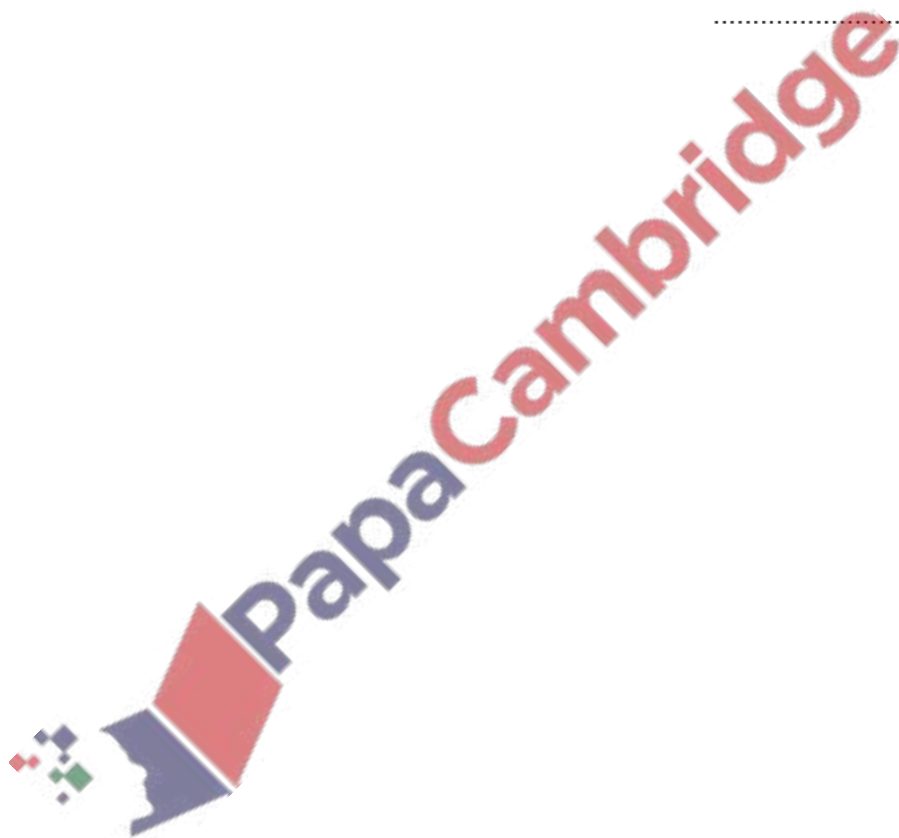
(a) Write down all the factors of 28.

.... [2]

(b) Write 54 as a product of its prime factors.

.... [2]

(c) Find the lowest common multiple (LCM) of 48 and 60.

.... [2]

114.
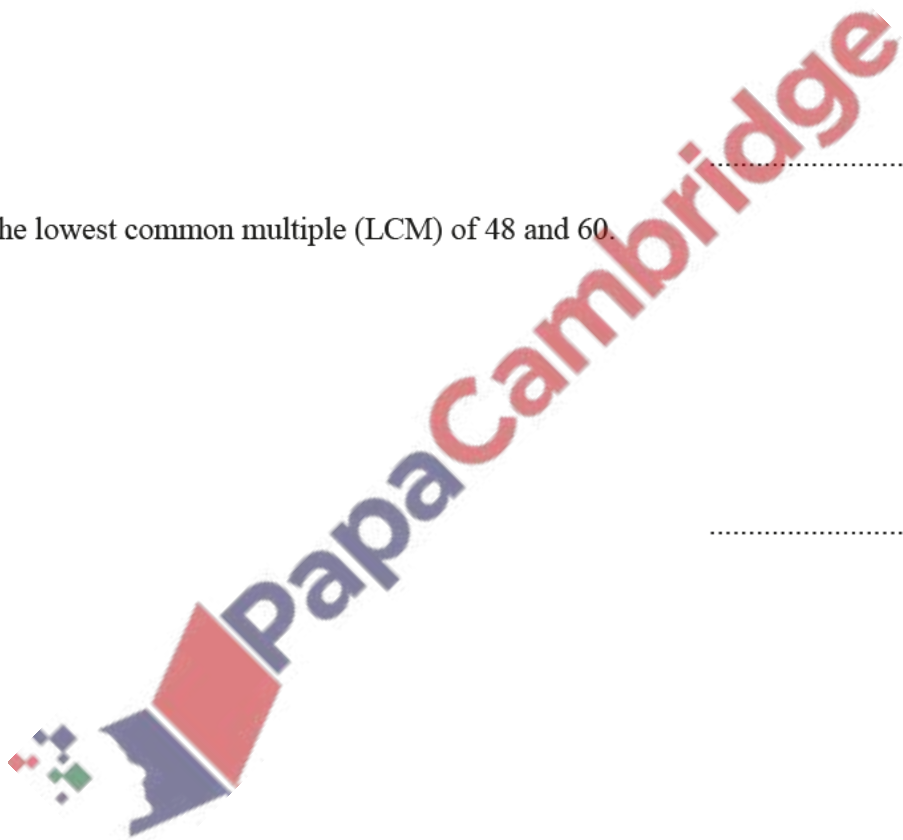
Write six hundred and seven thousand and twenty-one in figures.

.... [1]

115.
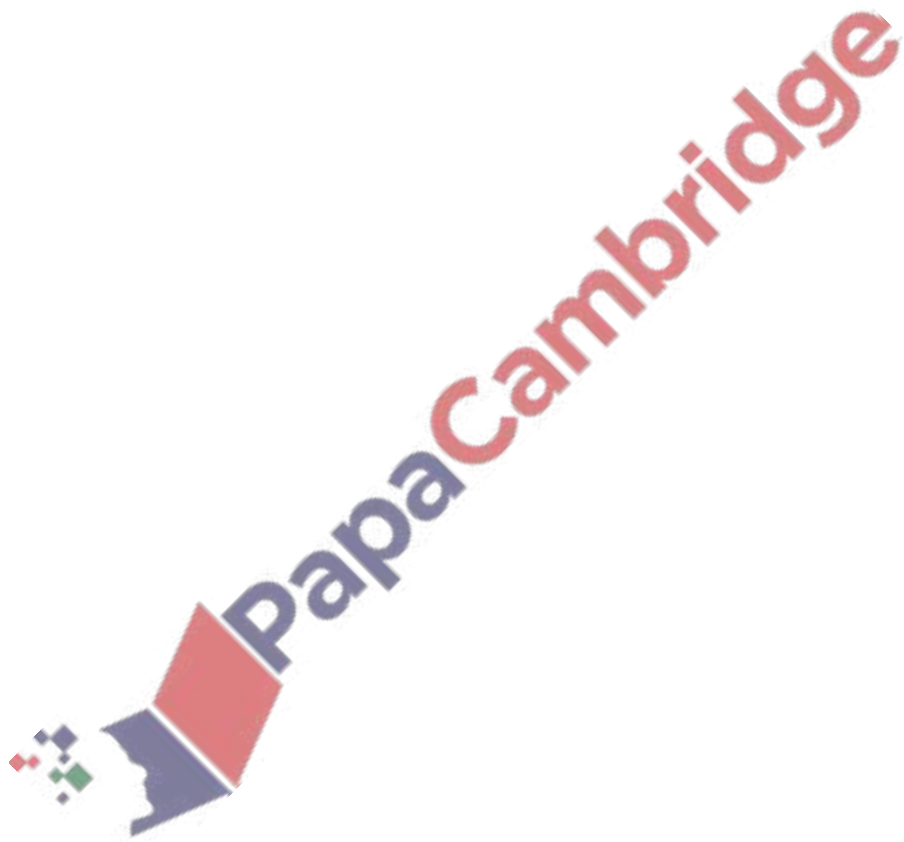
Edelgard tries to calculate $\dfrac{68+18}{9-5}$.

(a) She types into her calculator $68 + 18 \div 9 - 5$.

Explain why this does not give Edelgard the correct answer.

.... [1]

(b) Work out the correct answer to $\dfrac{68+18}{9-5}$.

.... [1]
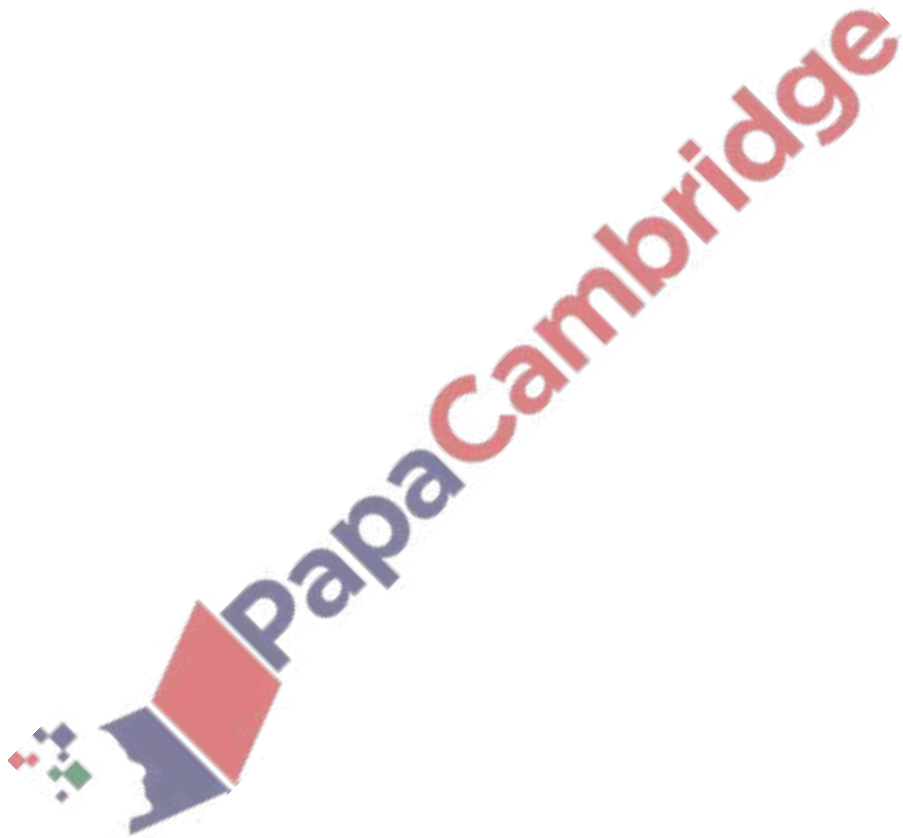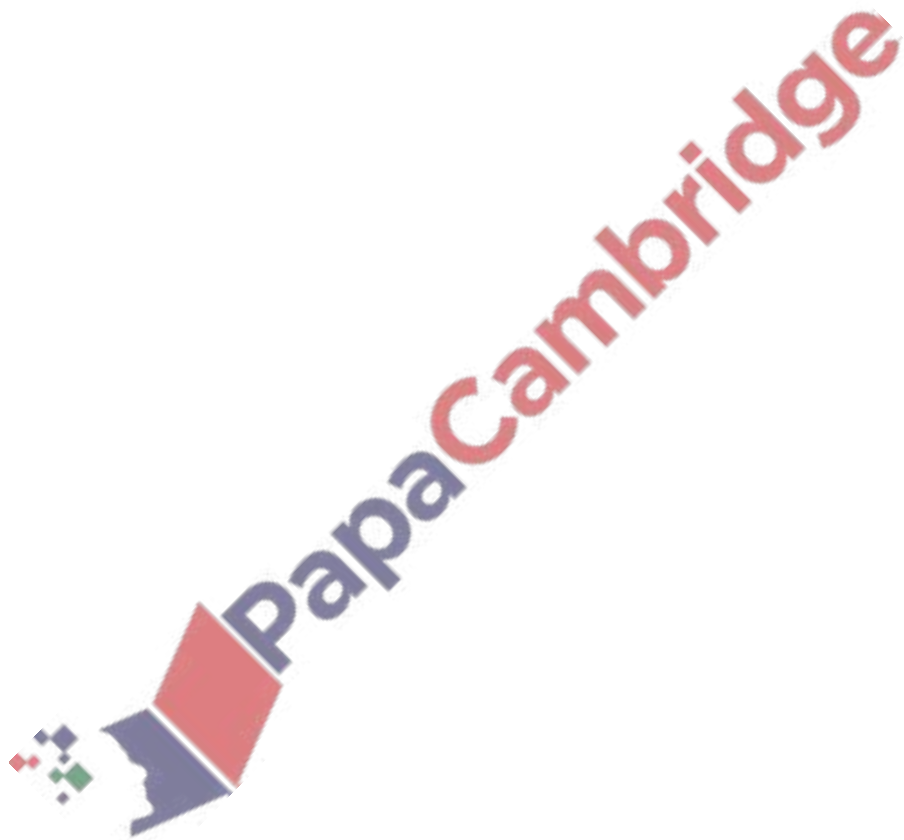
A train from Woodton to Northley takes 6 hours 25 minutes.
The train leaves Woodton at 19 46.

Work out the time the train arrives at Northley.

.... [1]

Write down the number that is 7 more than -38.

.... [1]
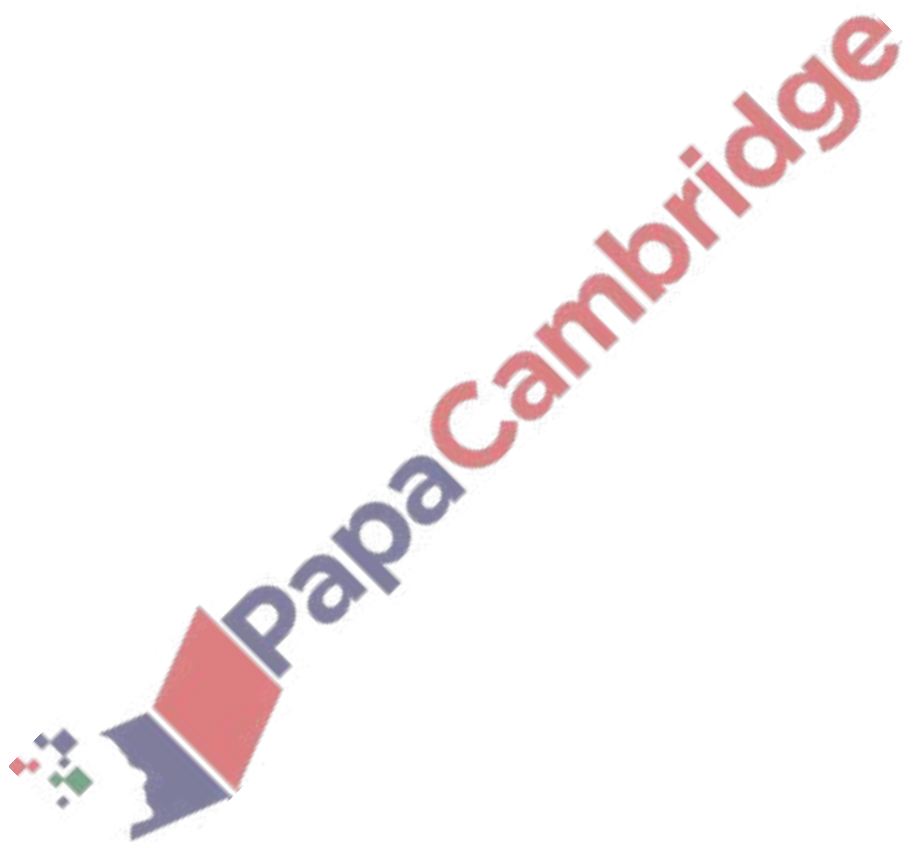
| 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |

From this list of numbers, write down

(a) a multiple of 8,

.... [1]

(b) a square number,

.... [1]

(c) a prime number.

.... [1]
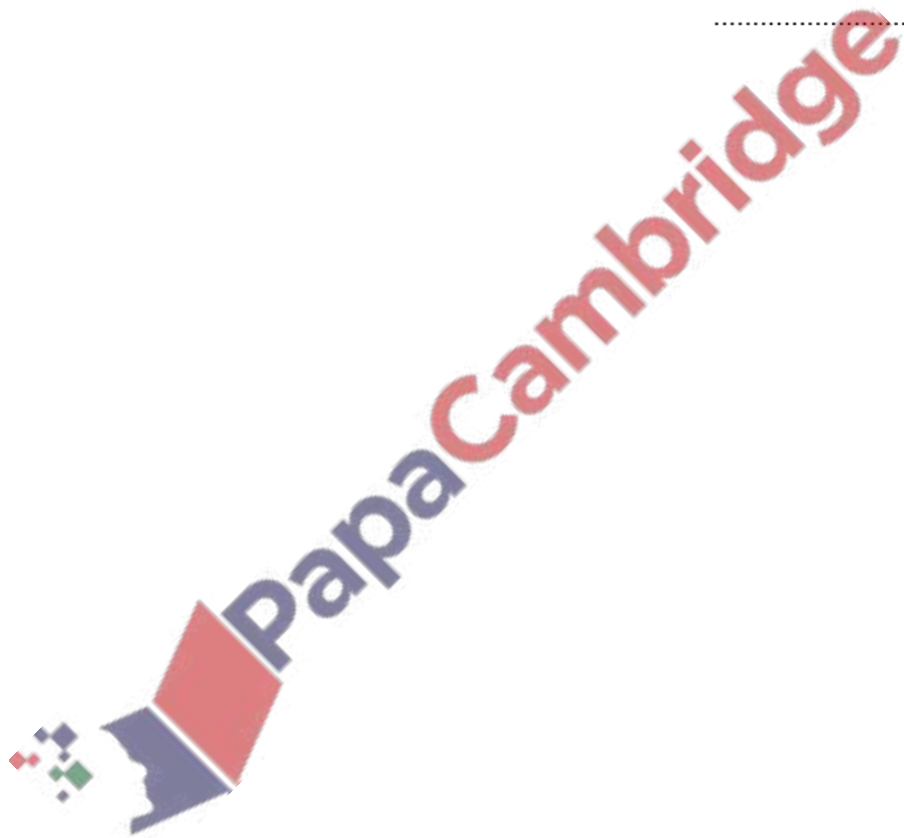
A bag contains yellow balls, pink balls and green balls only.

The ratio   yellow balls : pink balls : green balls = 7 : 3 : 5.
There are 42 yellow balls in the bag.

Work out the total number of balls in the bag.

.... [2]
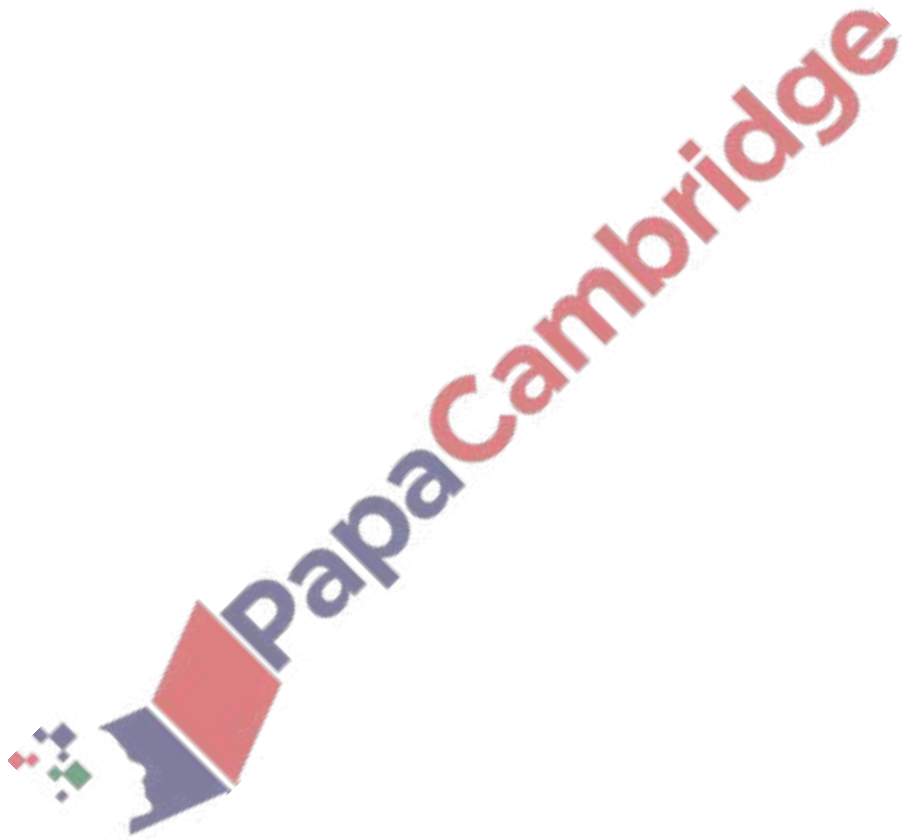
120.

Without using a calculator, work out $3\frac{1}{4} - 2\frac{2}{3}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]
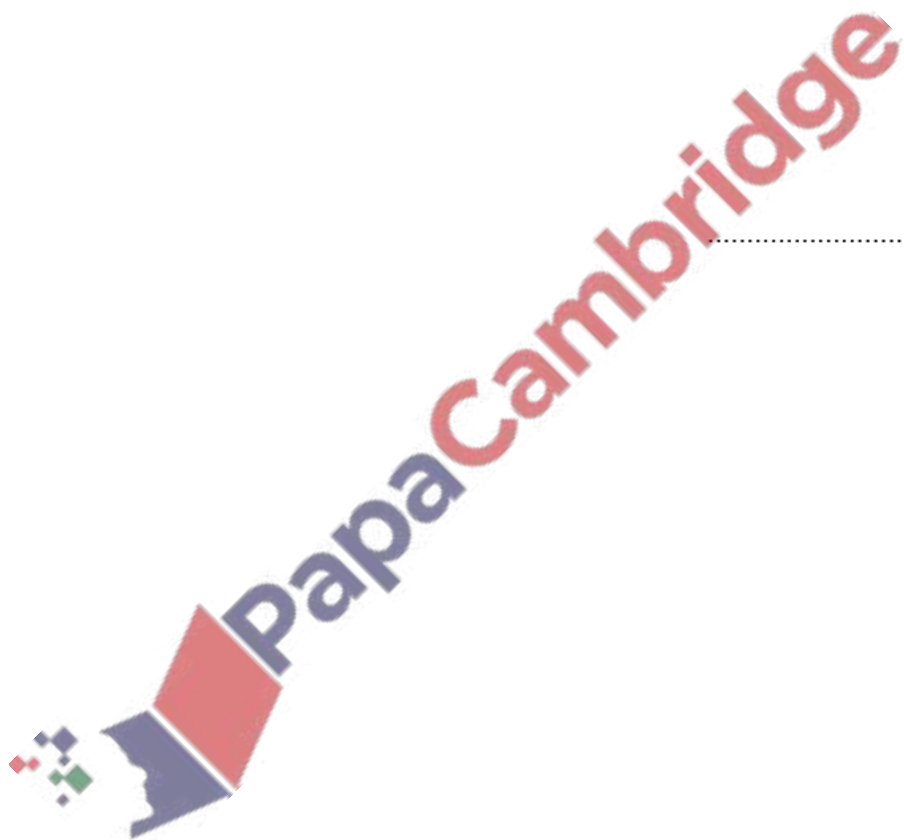
A chef buys some cheese from France.
200 g of cheese costs 3.45 euros.
The exchange rate is $1 = 0.84$ euros.

Work out the maximum mass of cheese the chef can buy with $150.
Give your answer in kilograms, correct to 1 decimal place.

.... kg [4]
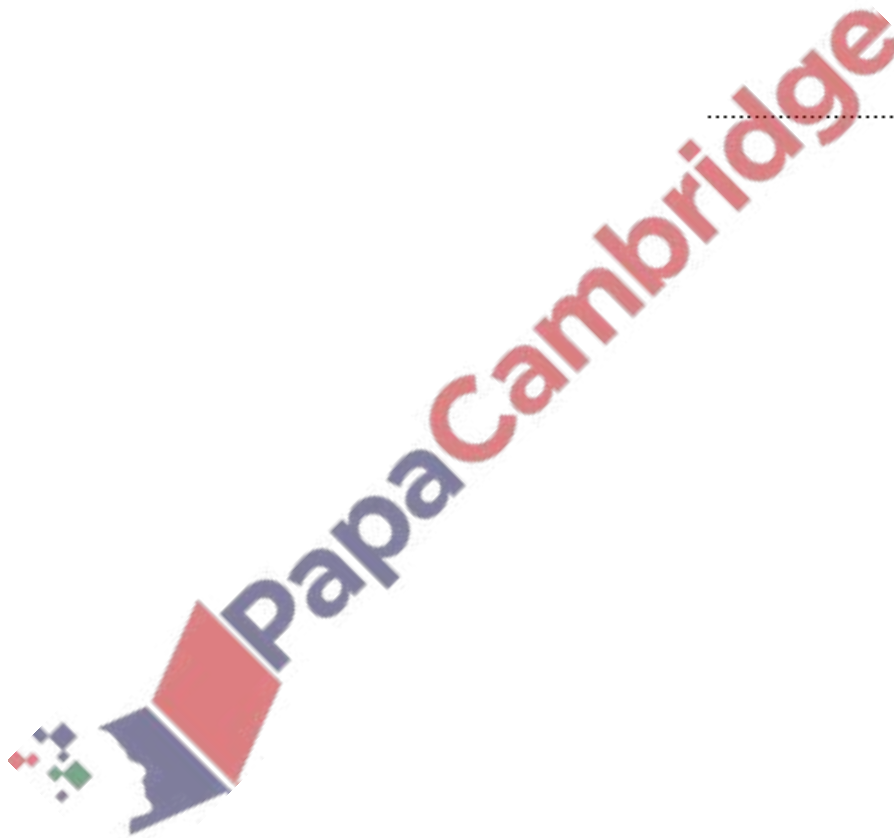
Sonia wants to invest $5000 for 6 years.

Bank A pays compound interest at a rate of 3.5% per year.
Bank B increases the $5000 by 22% at the end of 6 years.

Which bank will give Sonia the most money at the end of 6 years and by how much?
You must show all your working.

Bank A

Bank B

Bank .... will give $ .... more money. [5]

123.
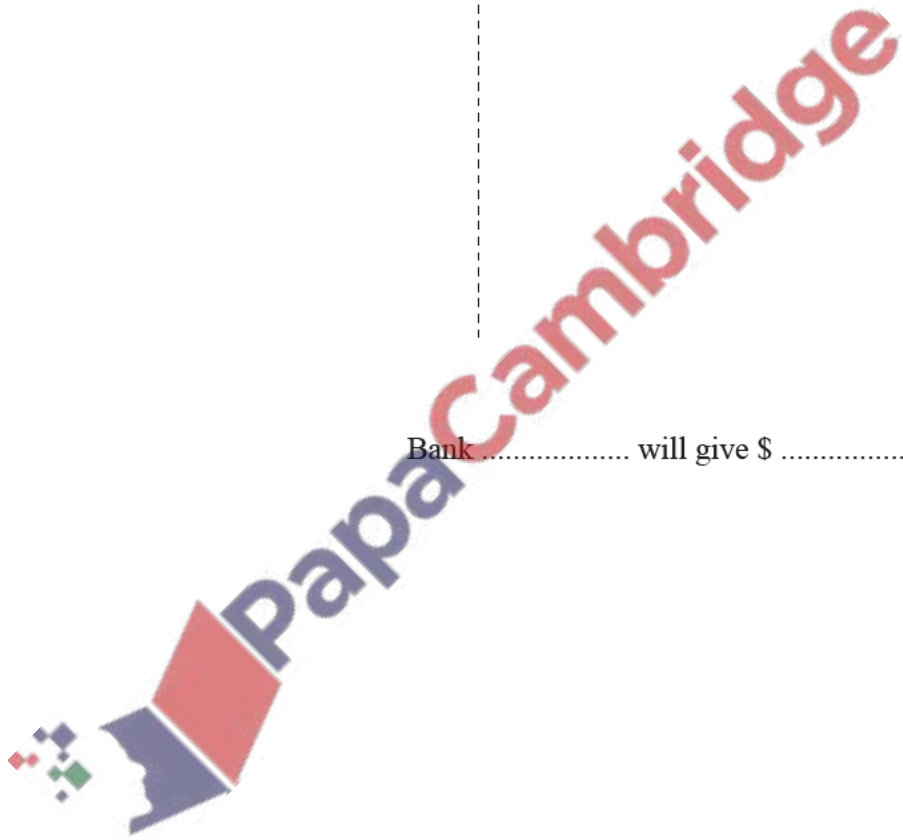
By rounding each number correct to 1 significant figure, estimate the value of

$$\frac{71 \times 32.4}{4.8^2}.$$

You must show all your working.

.... [2]

124.
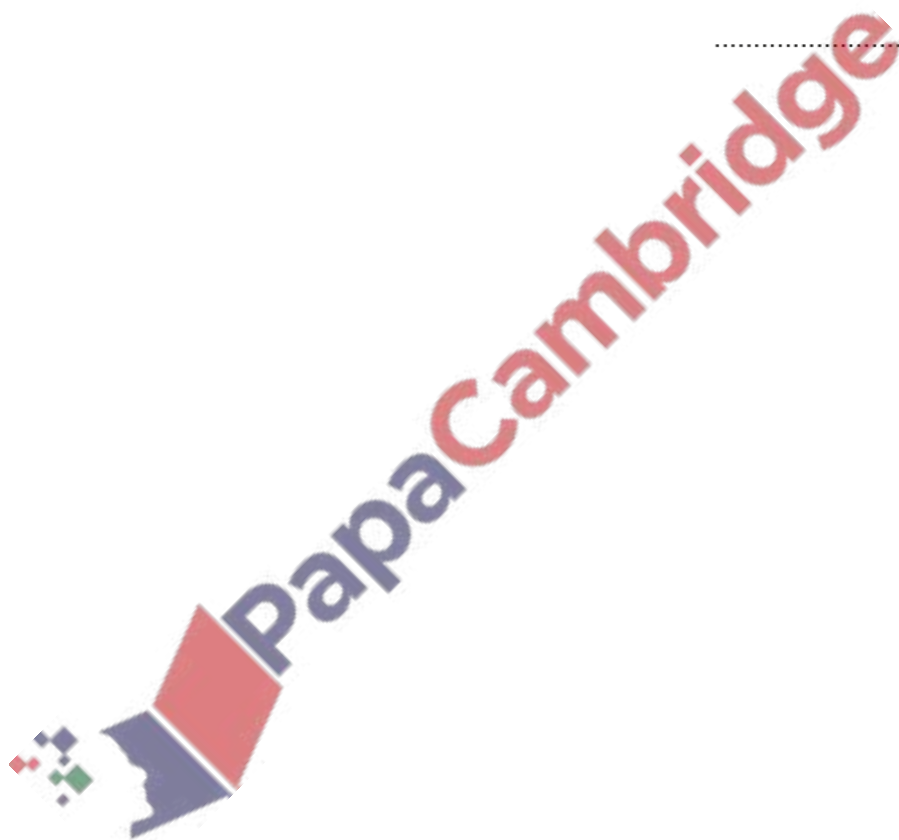
Des thinks of two numbers.
The sum of his two numbers is −6.
The difference between his two numbers is 62.

Find the two numbers.

.... and .... [4]
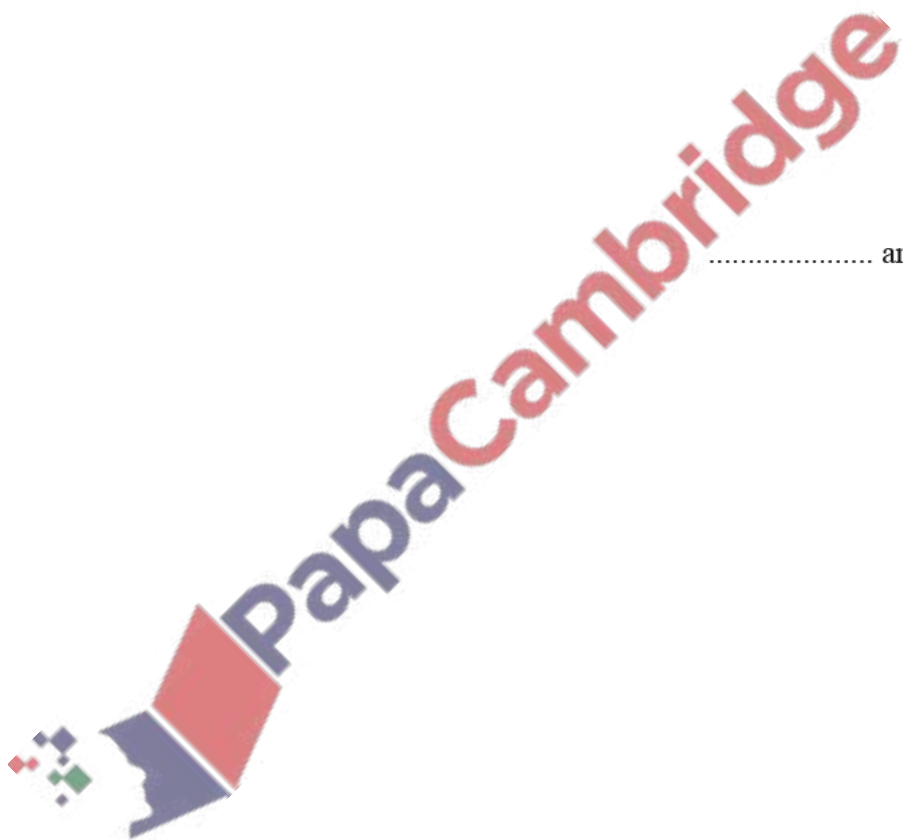
Find the highest **odd** number that is a factor of 60 and a factor of 90.

.... [1]

126.

$234 = 2 \times 3^2 \times 13$ $1872 = 2^4 \times 3^2 \times 13$ $234 \times 1872 = 438\,048$

Use this information to write $438\,048$ as a product of its prime factors.

.... [1]
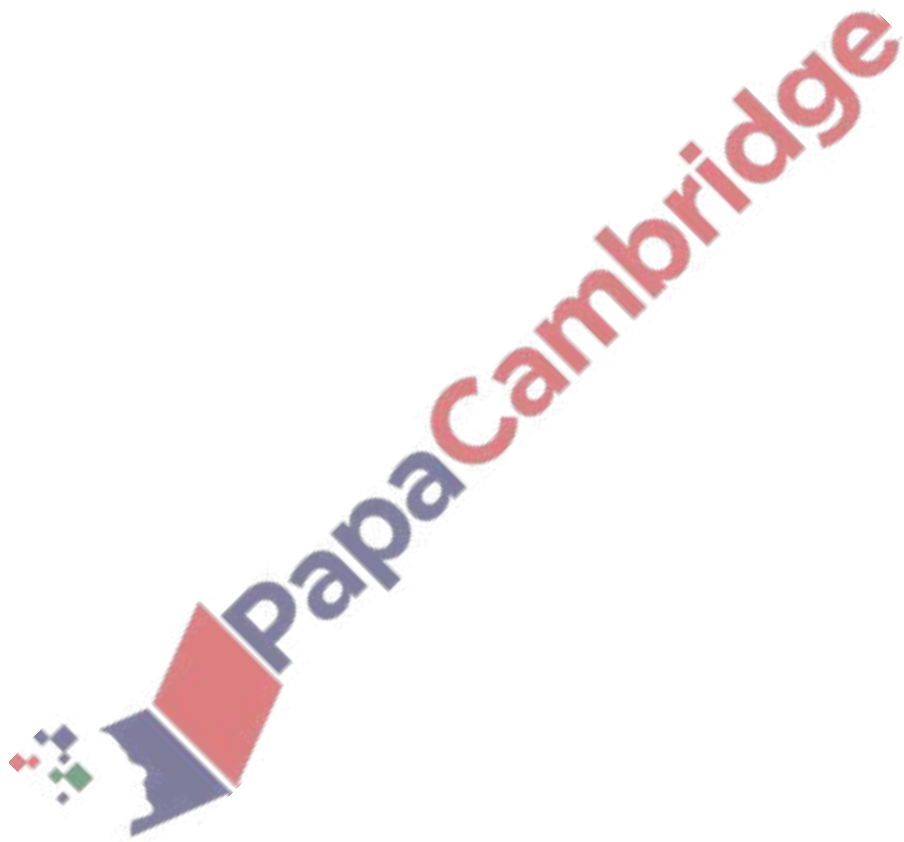
141

Without using a calculator, work out $\left(2\frac{1}{3} - \frac{7}{8}\right) \times \frac{6}{25}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [4]

128.
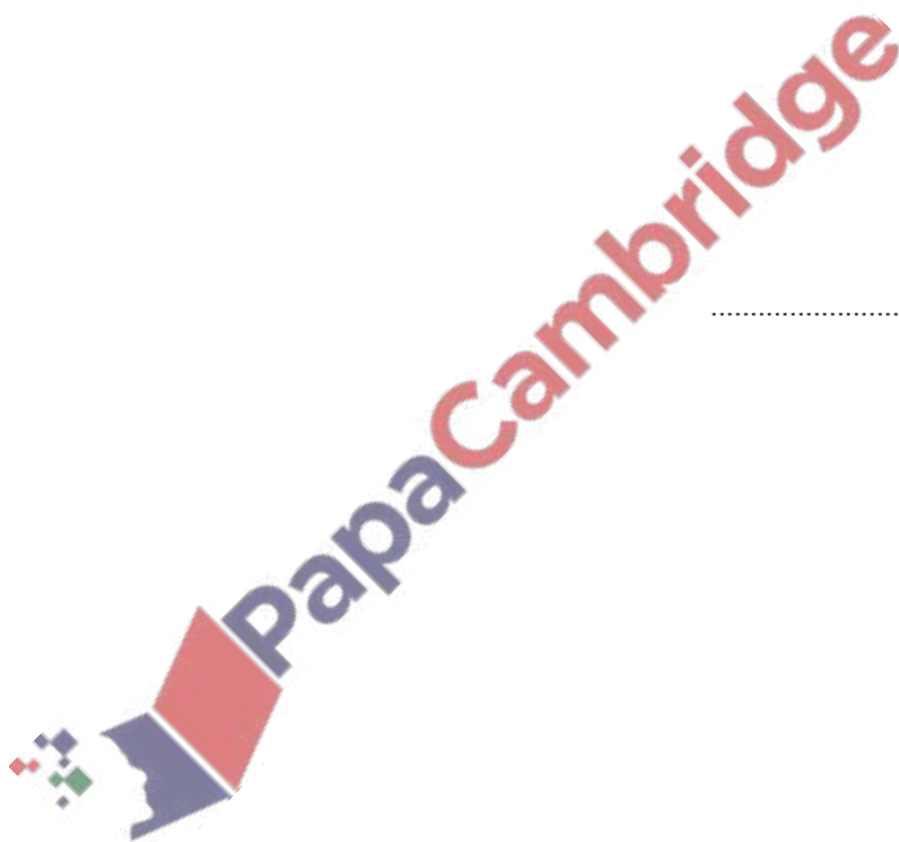
m is inversely proportional to the square of $(p-1)$.
When $p = 4$, $m = 5$.

Find m when $p = 6$.

$m =$ .... [3]
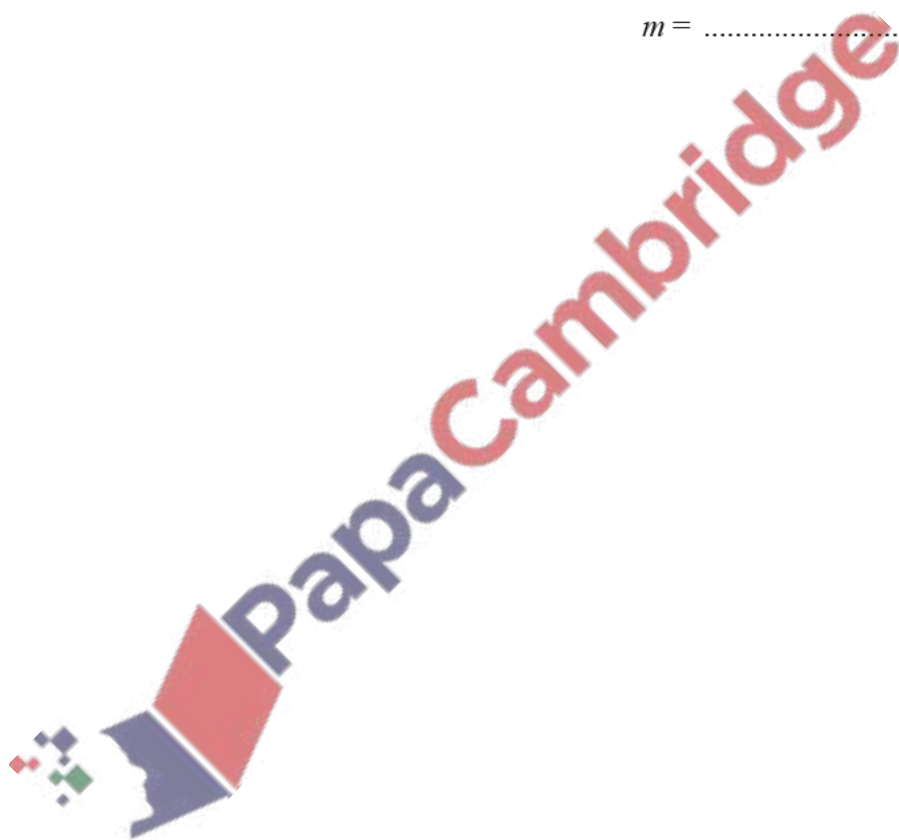
$P = 2(w + h)$

$w = 12$ correct to the nearest whole number.
$h = 4$ correct to the nearest whole number.

Work out the upper bound for the value of P.

.... [2]

130.
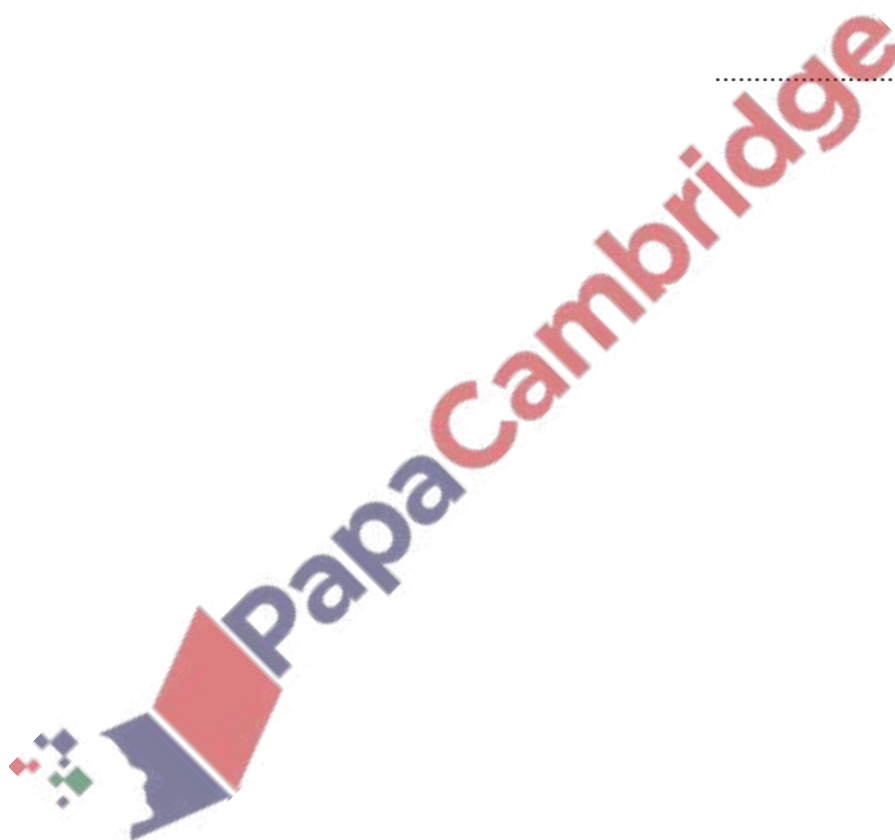
At noon the temperature in Maseru was 21 °C.
At midnight the temperature had fallen by 26 °C.

Work out the temperature at midnight.

.... °C [1]
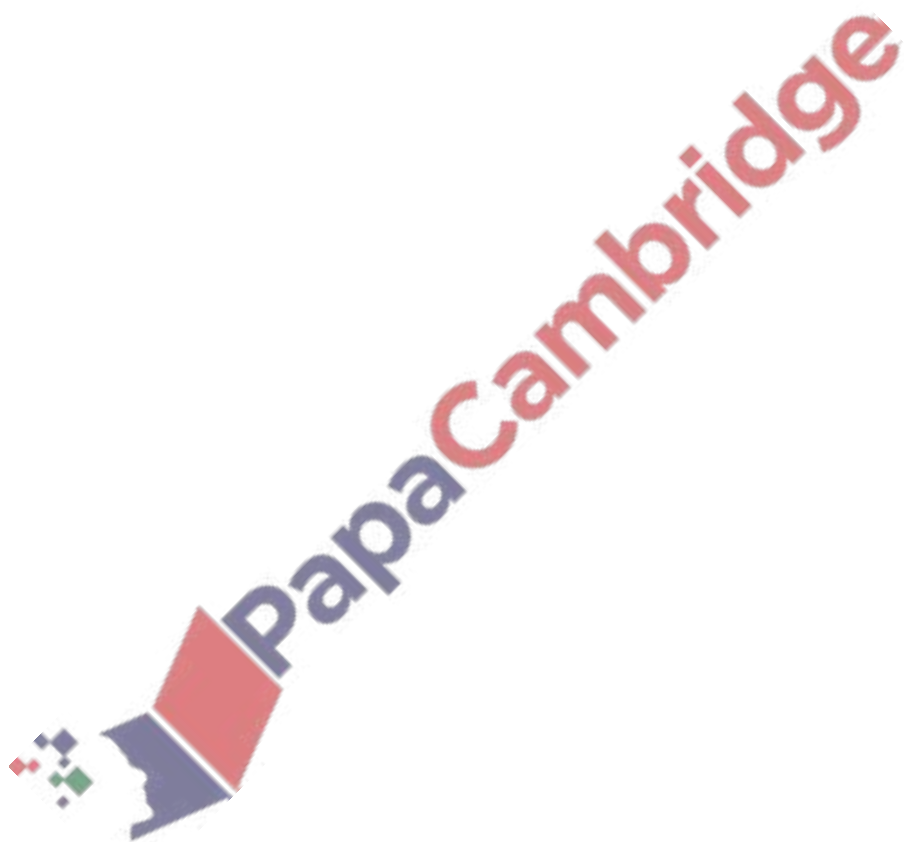
Write down

(a) a square number greater than 10,

.... [1]

(b) an irrational number.

.... [1]

On the Venn diagram, shade the region $A \cap B$. [1]

Without using a calculator, work out $1\frac{3}{4} - \frac{11}{12}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]

134.

Roberto buys a toy for $5.00 .
He then sells it for $4.60 .

Calculate his percentage loss.

.... % [2]
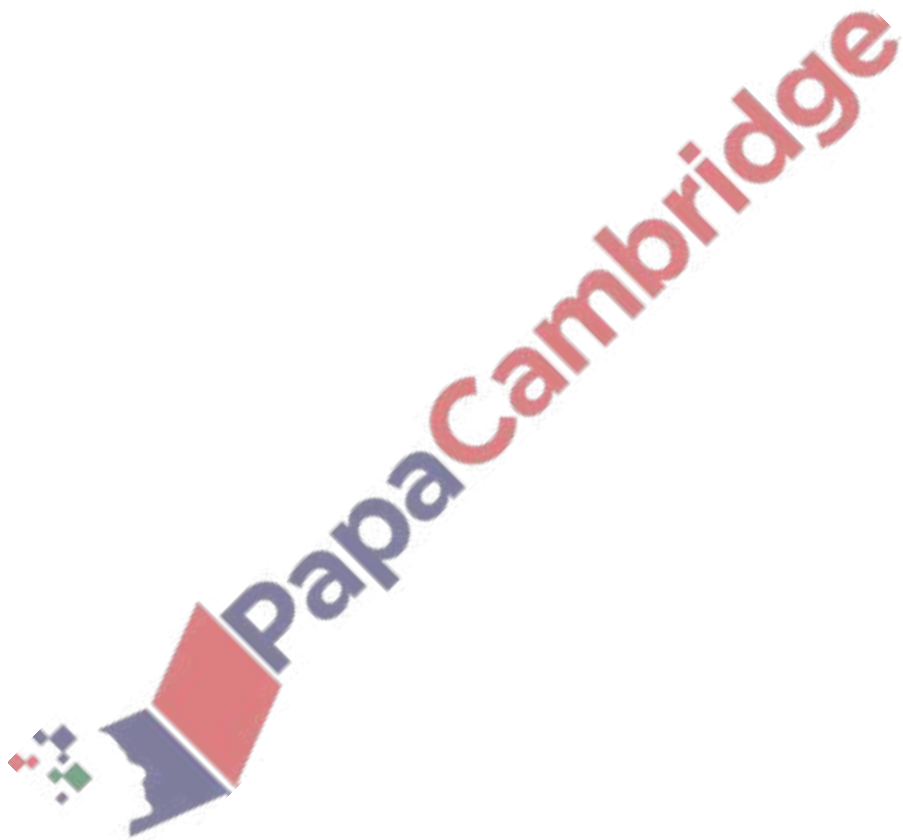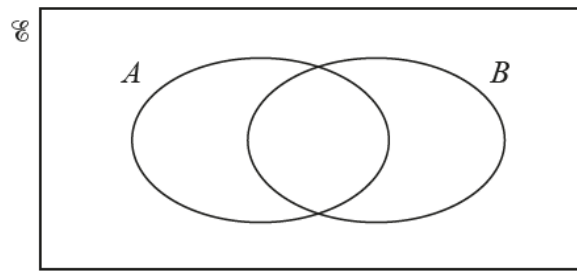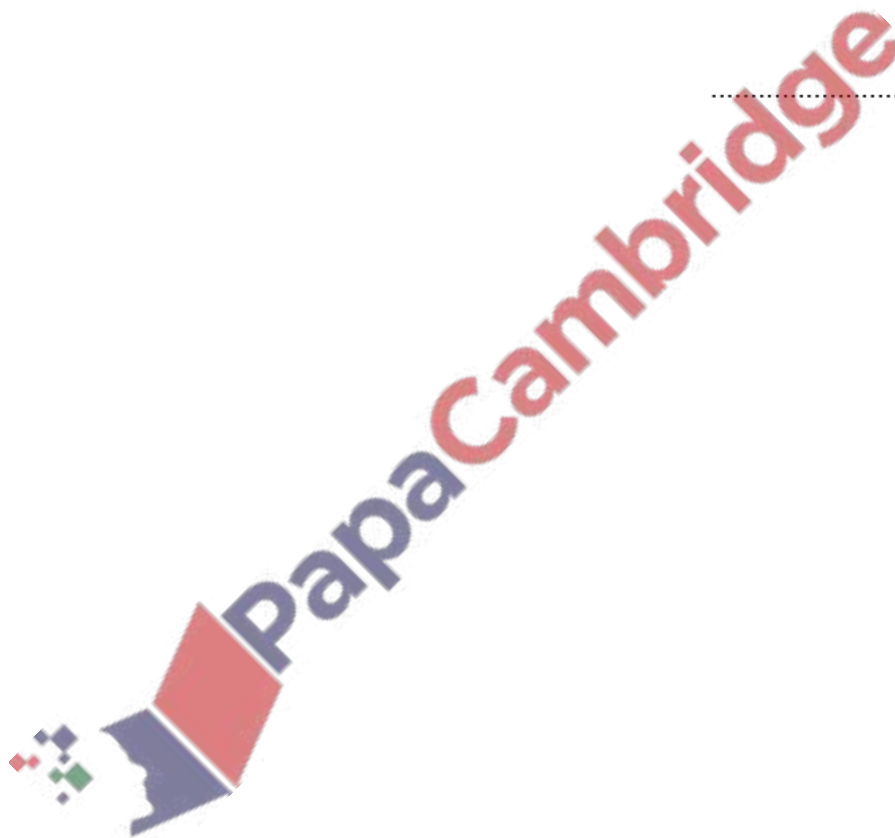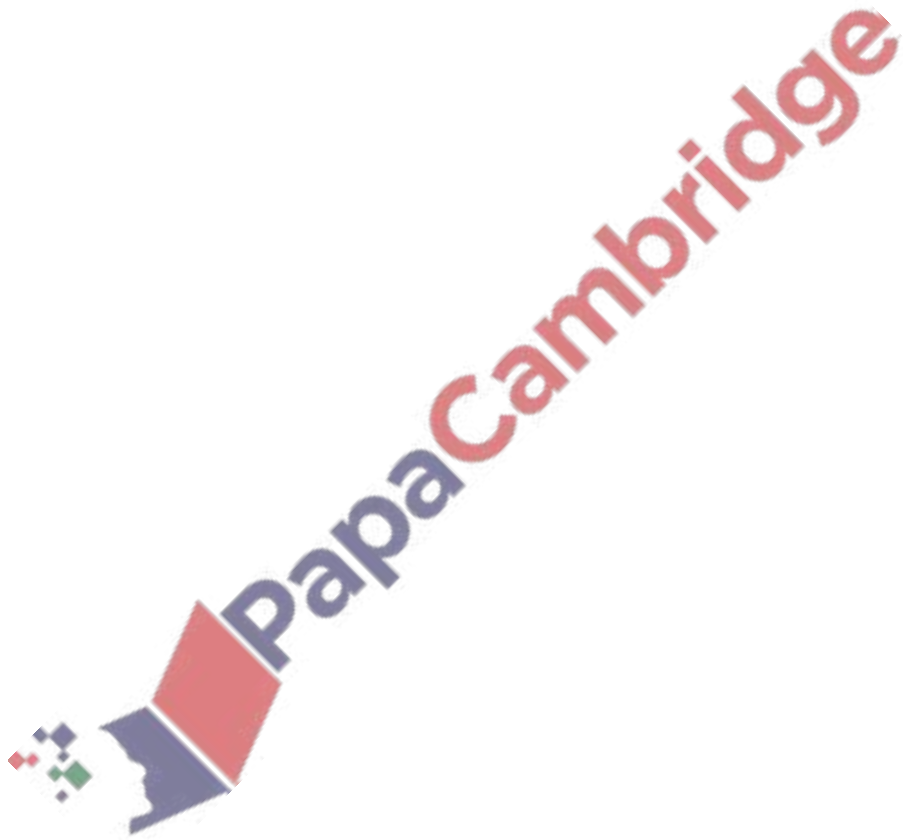
Ella's height is 175 cm, correct to the nearest 5 cm.

Write down the upper bound of Ella's height.

.... cm [1]
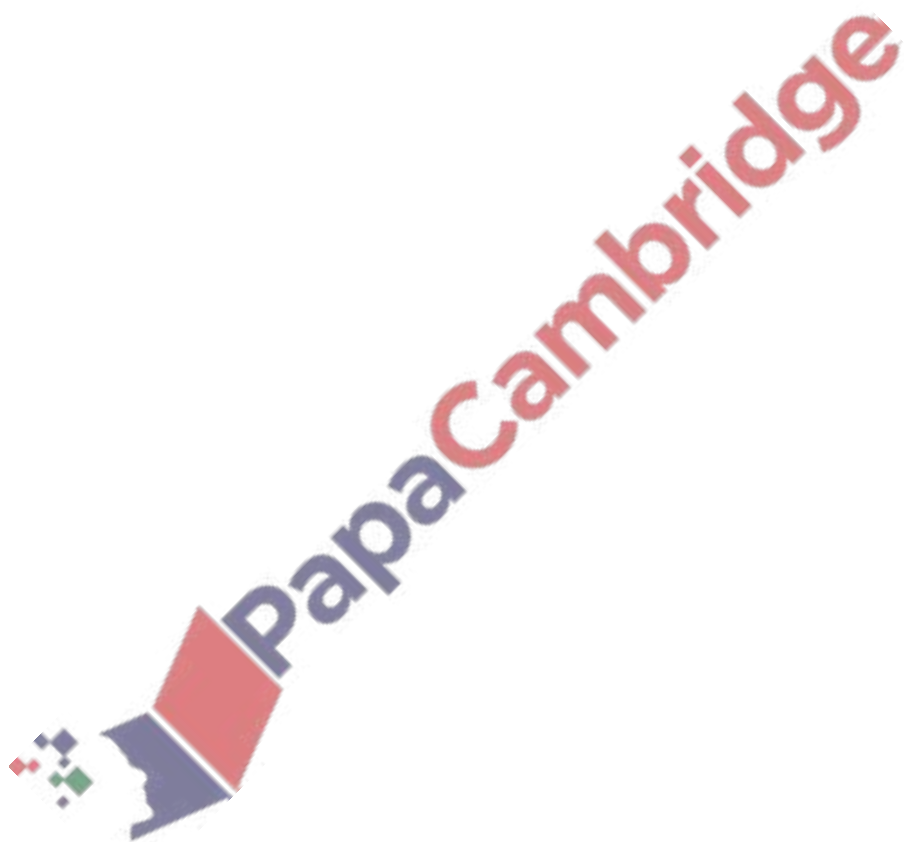
Calculate $(3 \times 10^{-3})^3$.
Give your answer in standard form.

.... [1]
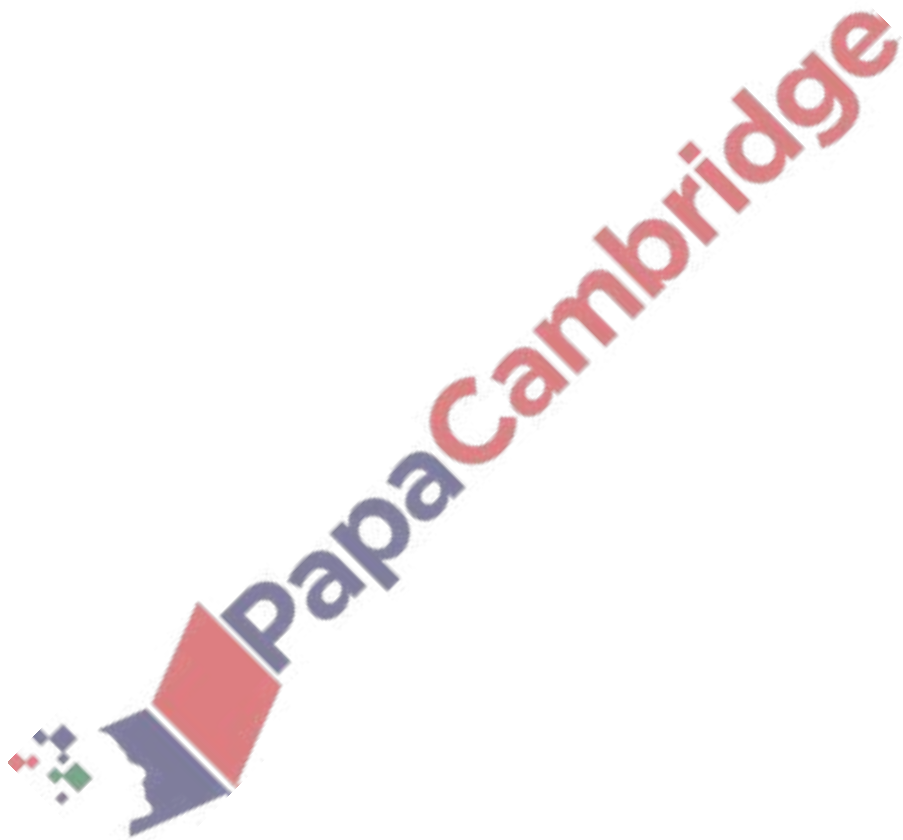
A train of length 105 m takes 11 seconds to pass completely through a station of length 225 m.

Calculate the speed of the train in km/h.

.... km/h [3]
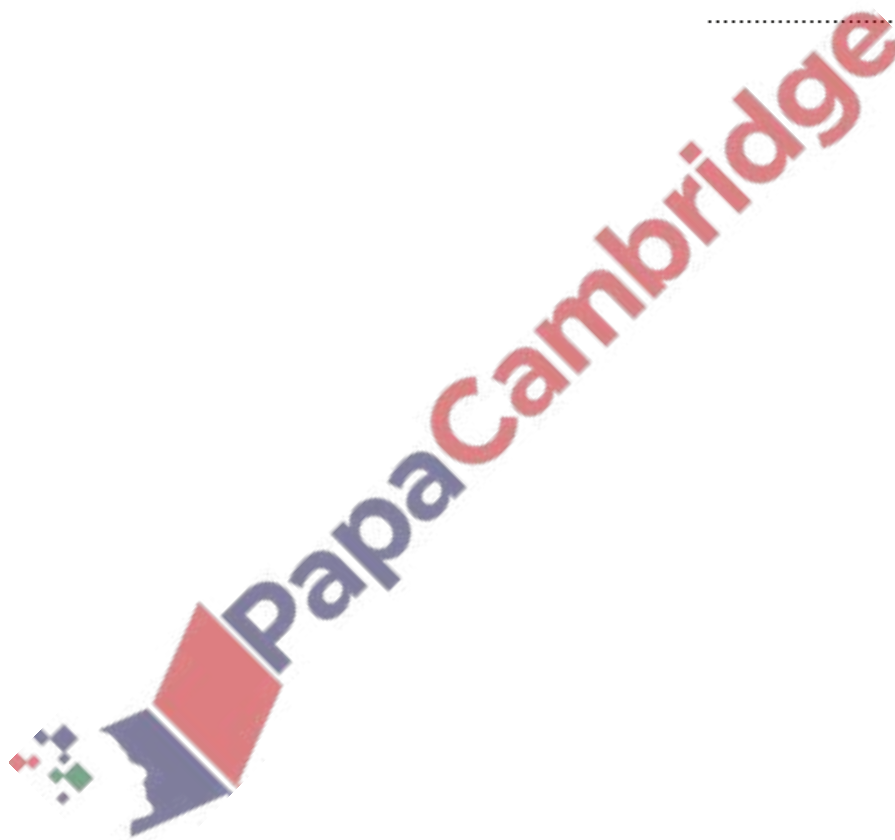
p is directly proportional to $(q+2)^2$.
When $q = 1$, $p = 1$.

Find p when $q = 10$.

$p =$ .... [3]
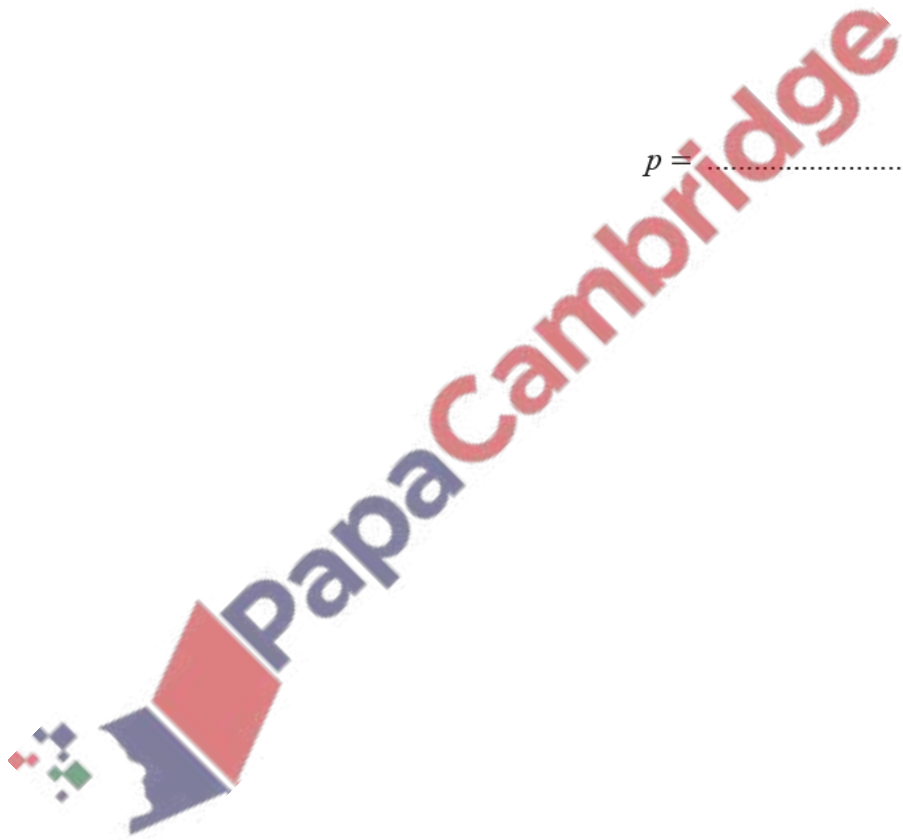
32	33	34	35	36	37	38	39

From this list of numbers, write down

(a) a multiple of 8,

.... [1]

(b) a square number,

.... [1]

(c) a prime number.

.... [1]
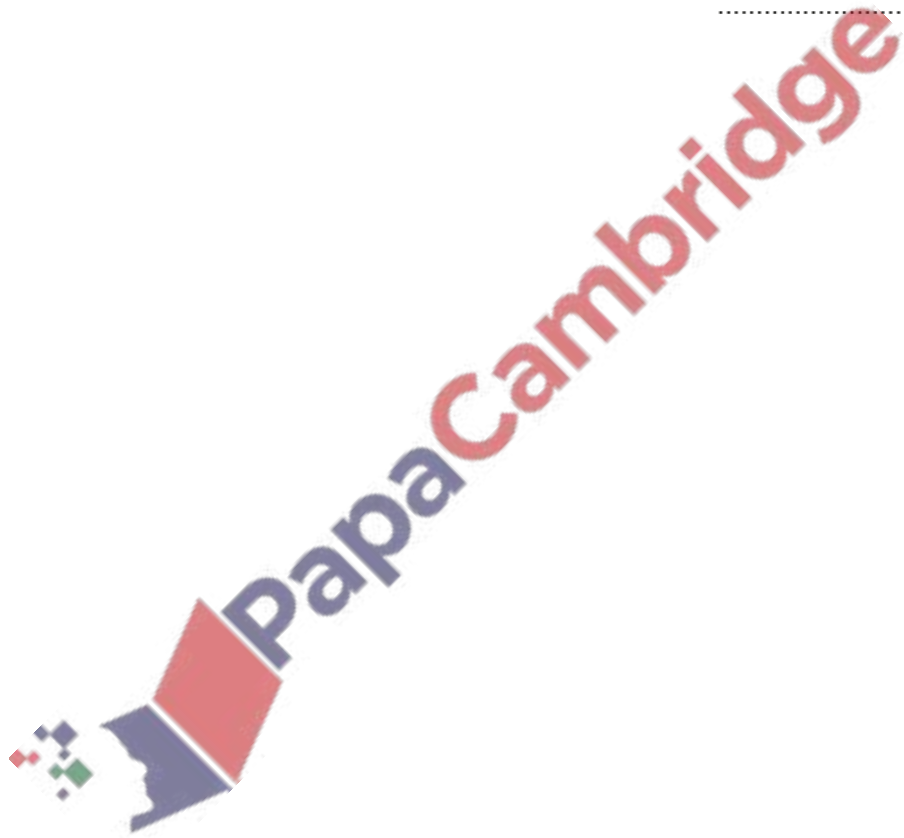
A train journey takes 5 hours 54 minutes.

(a) The journey starts at 09 15.

Find the time that the journey ends.

.... [1]

(b) The average speed of the train for this journey is 80 km/h.

Calculate the distance travelled.

.... km [2]
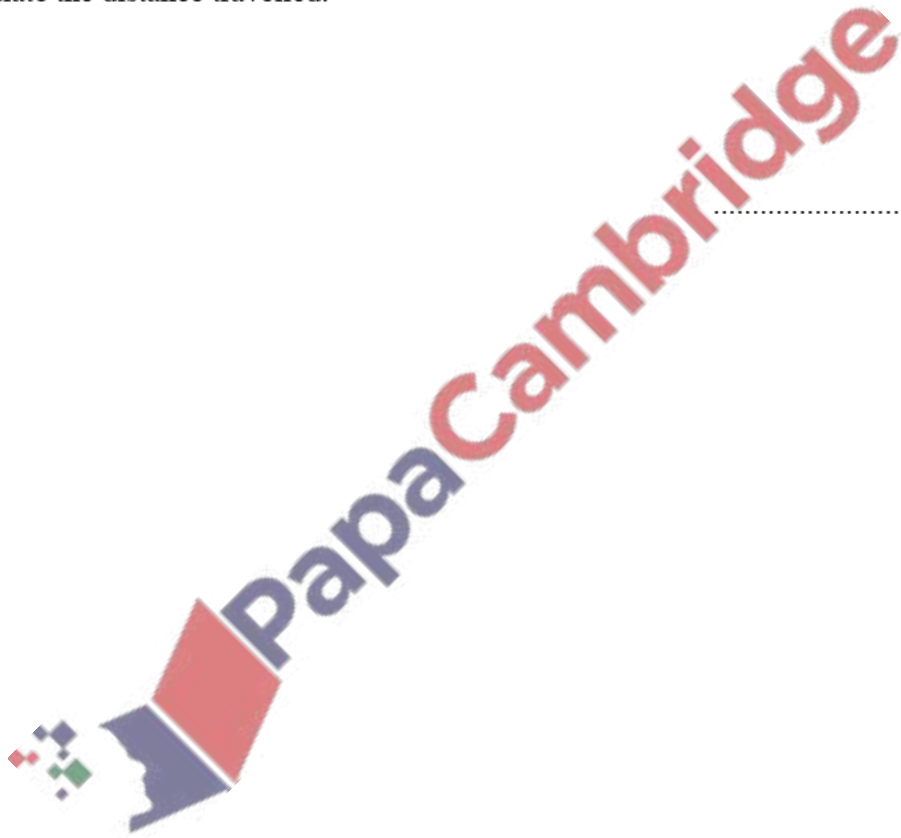
Sofia has a bag containing 8 blue beads and 7 red beads only.
She takes one bead out of the bag at random and replaces it.
She does this 90 times.

Find the number of times she expects to take a red bead.

.... [2]
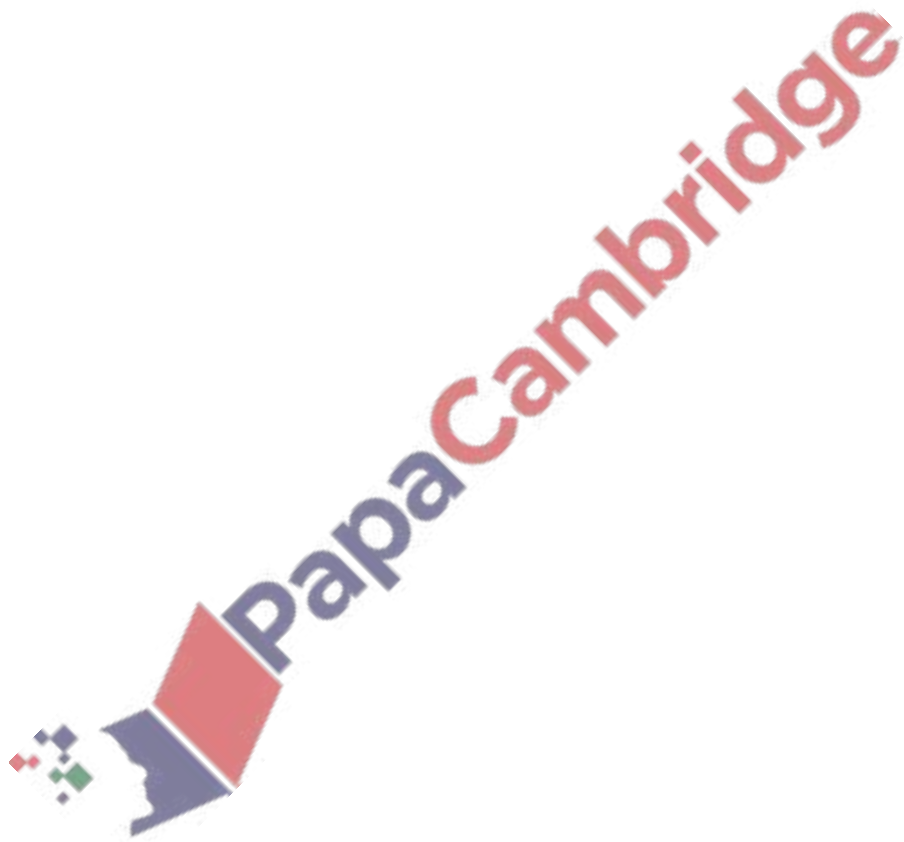
Without using a calculator, work out $3\frac{1}{4} - 2\frac{2}{3}$.

You must show all your working and give your answer as a fraction in its simplest form.

.... [3]

143.
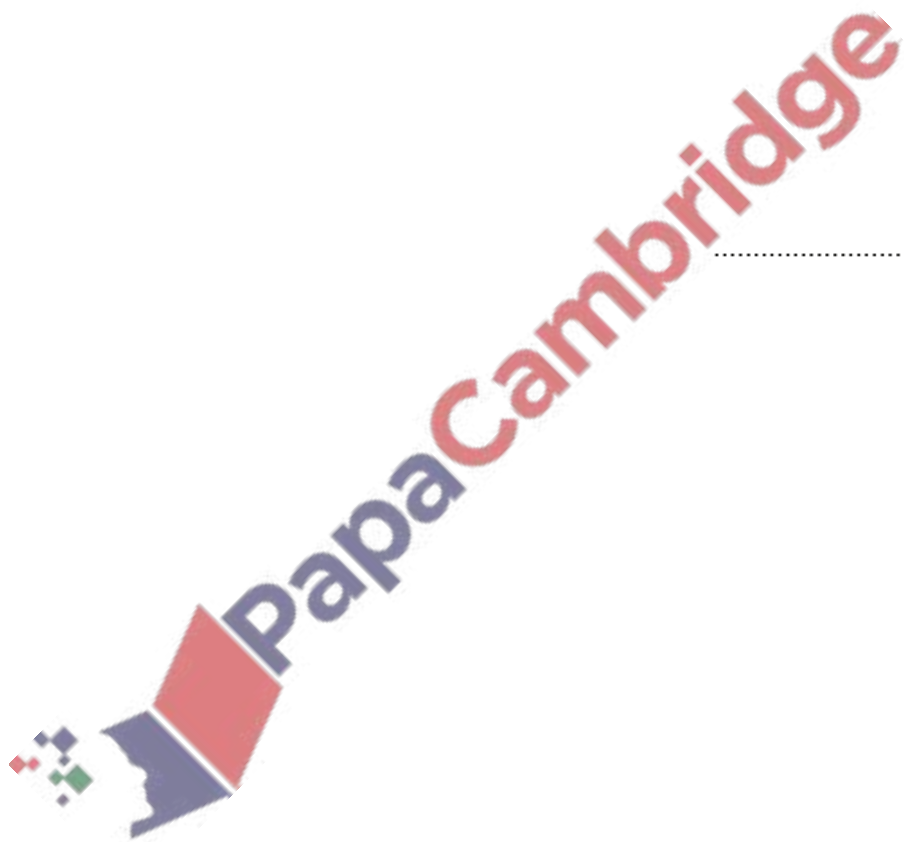
y is directly proportional to the cube root of $(x+3)$.

When $x = 5$, $y = \frac{2}{3}$.

Find y when $x = 24$.

$y = $ .... [3]
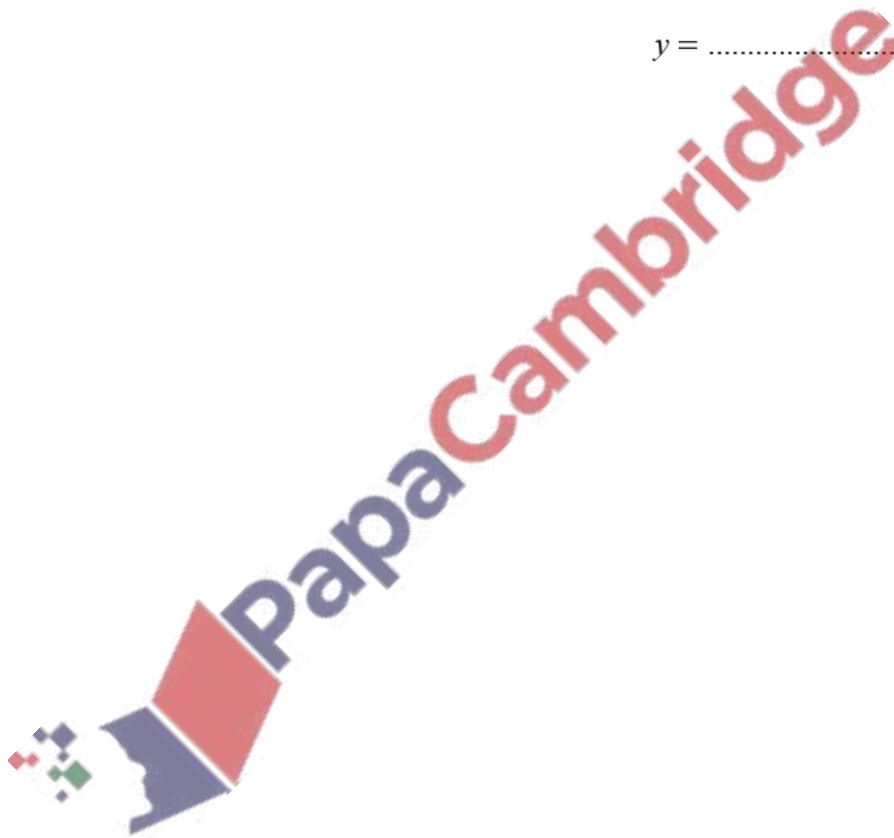
Paddy and Anna each invest $2000 for 5 years.
Paddy earns simple interest at a rate of 1.25% per year.
Anna earns compound interest at a rate of r% per year.
At the end of 5 years, Paddy's investment is worth the same as Anna's investment.

Calculate the value of r.
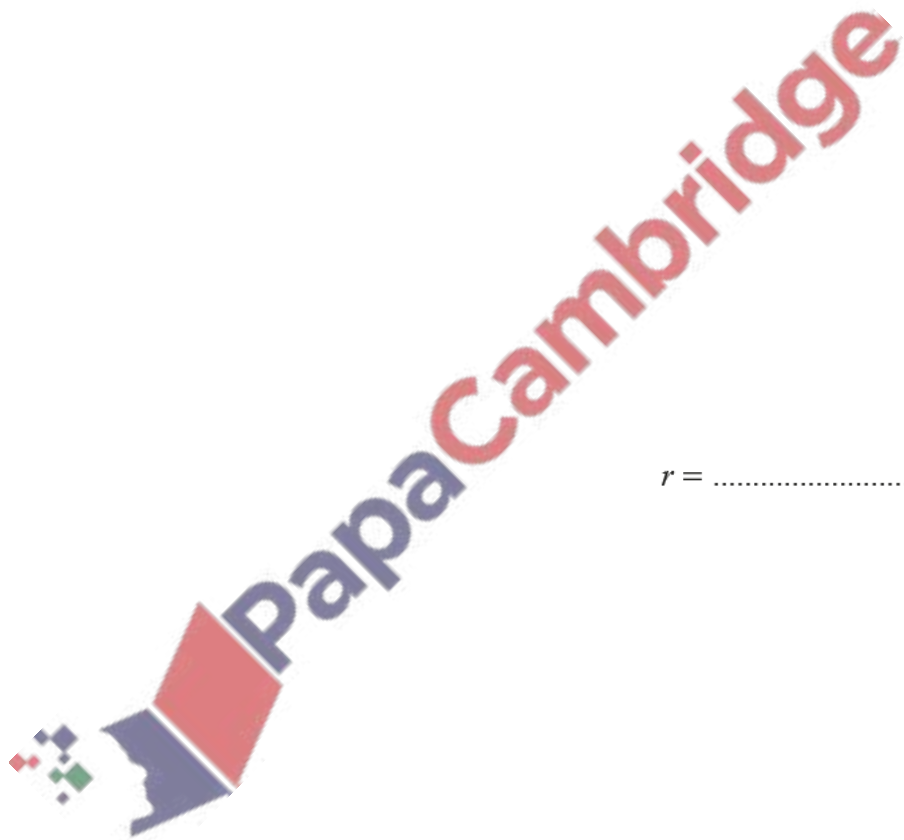
$r =$ .... [5]

(a) In a class of 40 students:

- 28 wear glasses (G)
- 13 have driving lessons (D)
- 4 do not wear glasses and do not have driving lessons.
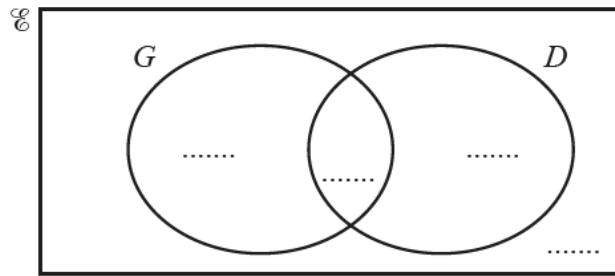
(i) Complete the Venn diagram. [2]

(ii) Use set notation to describe the region that contains a total of 32 students.

.... [1]

(b) This Venn diagram shows information about the number of students who play basketball (B), football (F) and hockey (H).
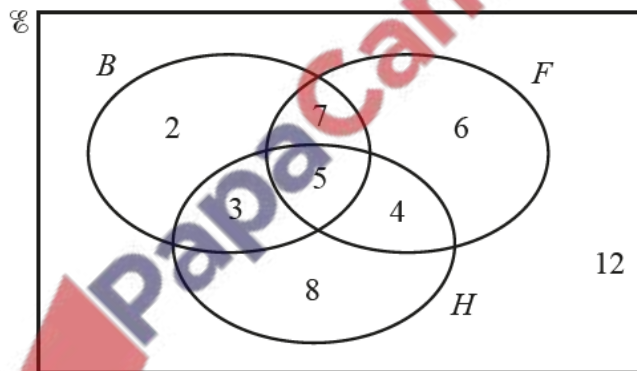
Find $n((B \cup F) \cap H')$.

.... [1]

(c)
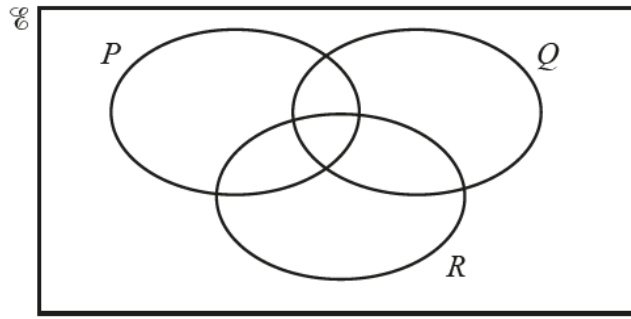
Shade the region $P \cup (Q \cap R)'$.   [1]

146.
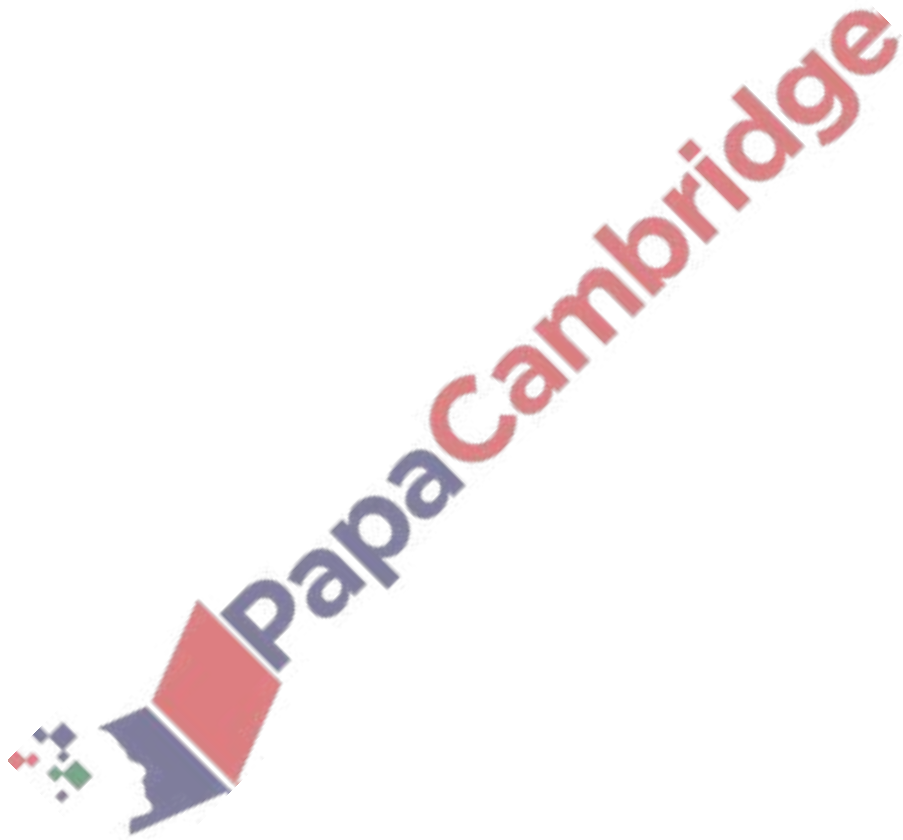
Gabriela designs the seating layout for a new theatre.
There are three sections of seats, A, B and C.

(a) Section A has 152 seats.
Section B has 12.5% more seats than Section A.
Section C has $\frac{3}{8}$ of the number of seats in Section A.

   (i) Show that the number of seats in Section B is 171.

[1]

   (ii) Show that the total number of seats is 380.

[2]

(b) Write down and simplify the ratio of the number of seats in each section A : B : C.

A : B : C = ... : .... : .... [2]
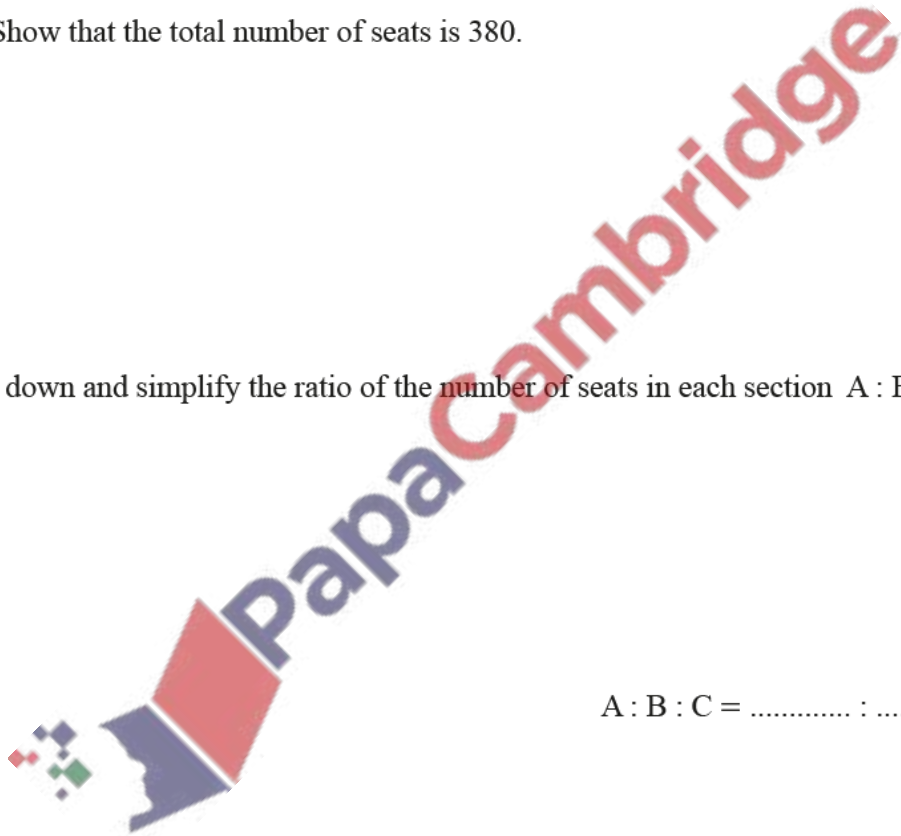
(c) In Section A:

- There are 12 seats in the front row.

- Each row has 2 more seats than the row in front of it.

Work out the number of rows for the 152 seats in Section A.

.... rows [2]

(d) For a concert in the theatre, the ticket prices are in the ratio

$$A : B : C = 9 : 7 : 4.$$

A ticket for Section C costs $6.

(i) Show that a ticket for Section B costs $10.50 .

[1]

(ii) Find the cost of a ticket for Section A.

$ .... [1]
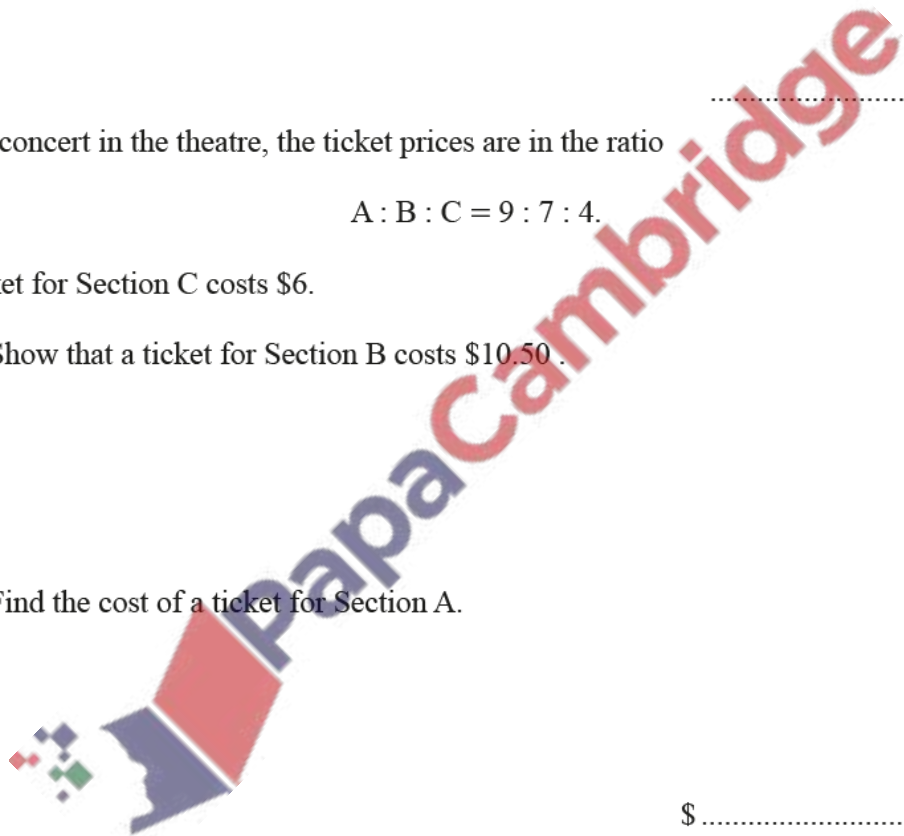
(iii) The table shows the number of tickets sold in each section.

Section	Number of tickets sold
A	120
B	136
C	30

Calculate the total amount received from the ticket sales.

$ .... [3]

(iv) The concert costs $4500 to organise.

Calculate the amount received from the ticket sales as a percentage of the $4500.

.... % [1]
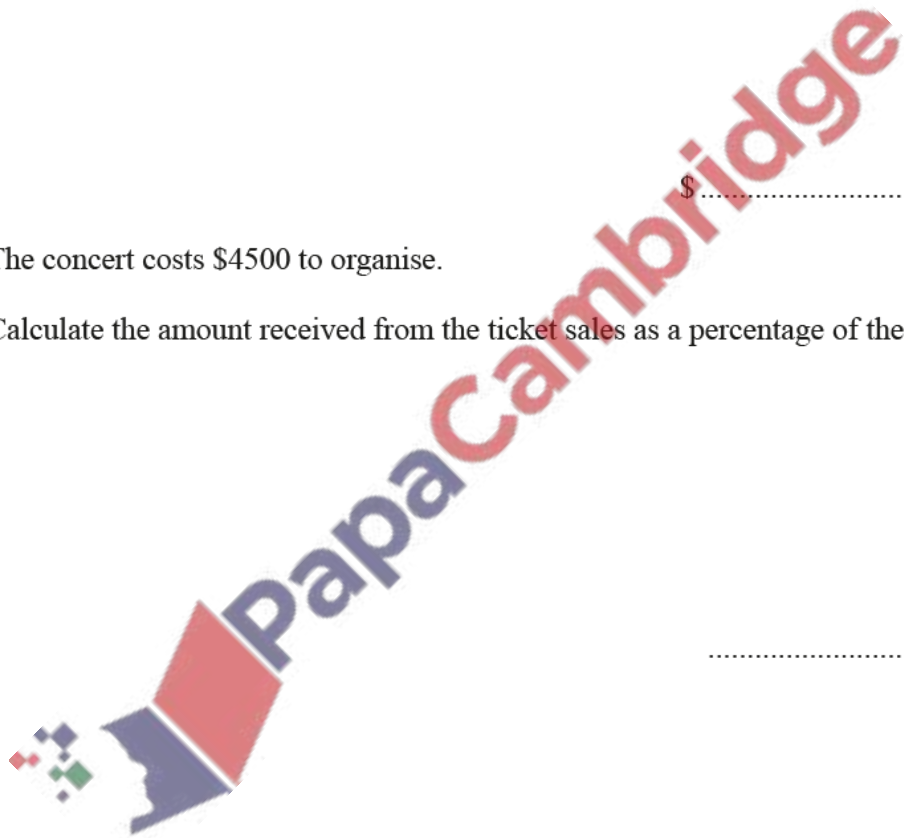
(a) Using the integers from 60 to 75 only, find

   (i) a multiple of 17,

.... [1]

   (ii) the prime numbers.

.... [2]

(b) Find

   (i) the square root of 4489,

.... [1]

   (ii) 4^3,

.... [1]

   (iii) $\sqrt[3]{274\ 625}$,

.... [1]

   (iv) $2^{-3} \times 24^2$.

.... [1]
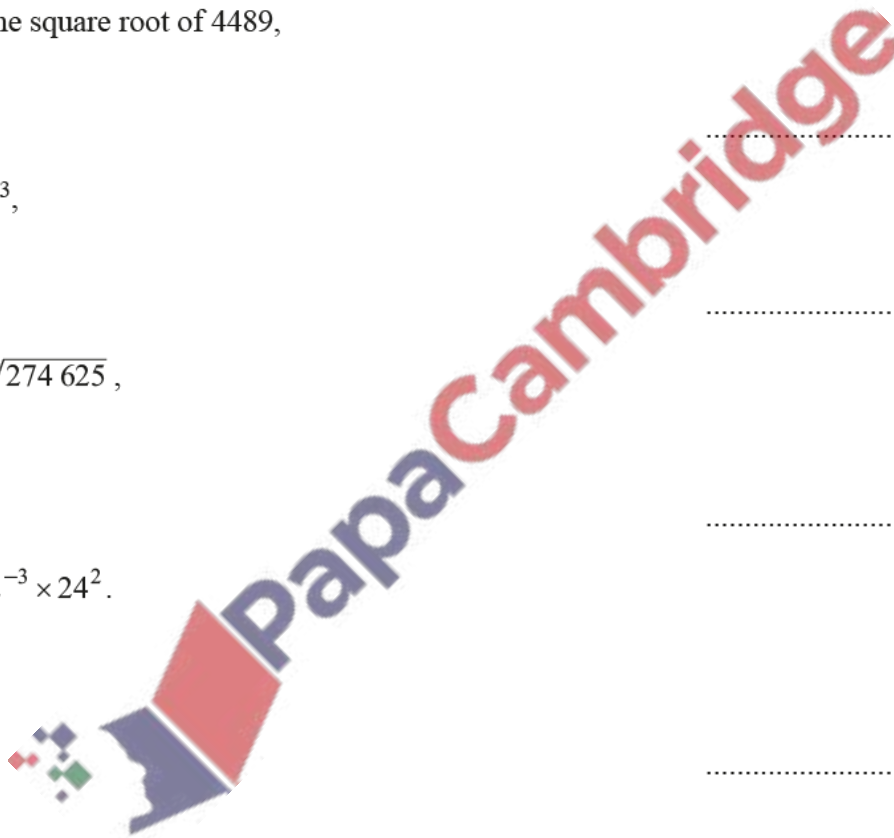
(c) Write down the reciprocal of 7.

.... [1]

(d) Write 3.72194 correct to 3 decimal places.

.... [1]

(e) Find the lowest common multiple (LCM) of 8 and 14.

.... [2]

(f) The average temperature at the North Pole is $-23\,°C$ in January and $-11\,°C$ in March.

(i) Find the difference between these temperatures.

.... $°C$ [1]

(ii) The average temperature in July is $28\,°C$ higher than the average temperature in March.

Find the average temperature in July.

.... $°C$ [1]

(a) Use set notation to describe the shaded region in each Venn diagram.

....

....
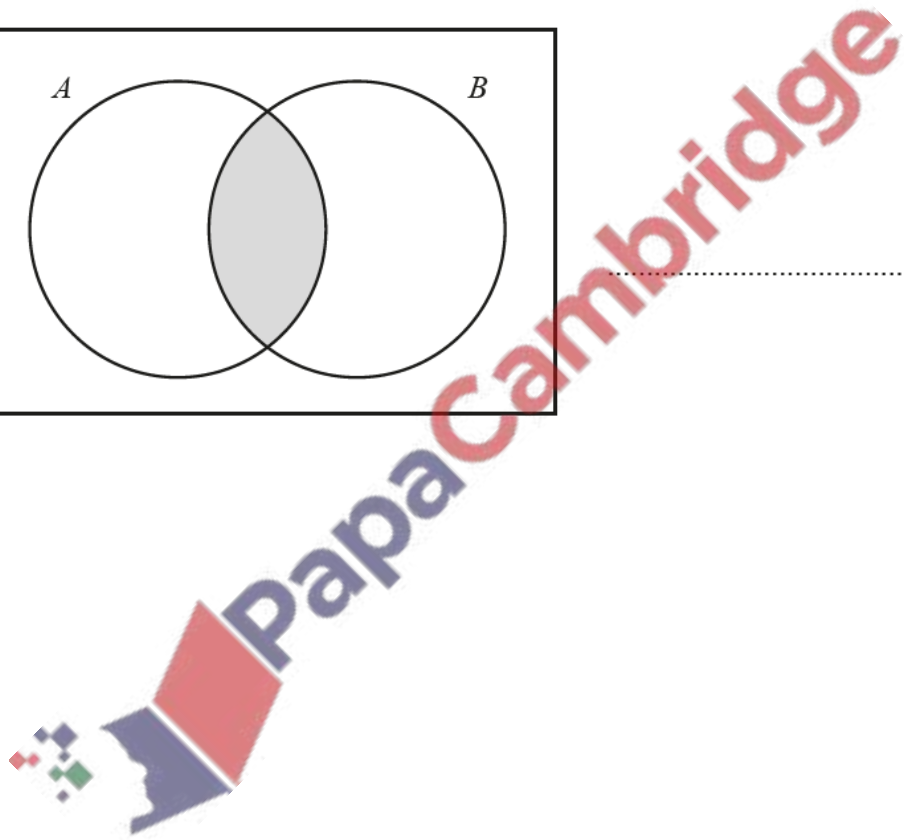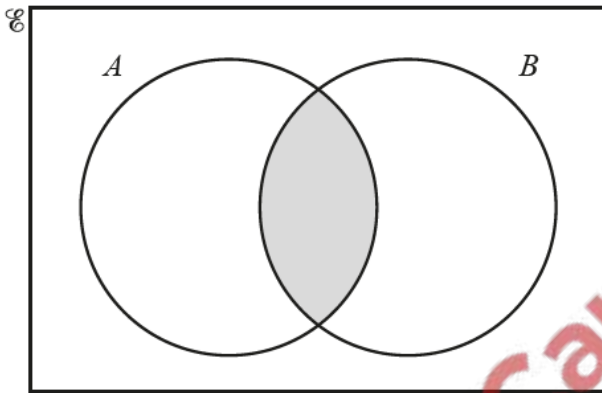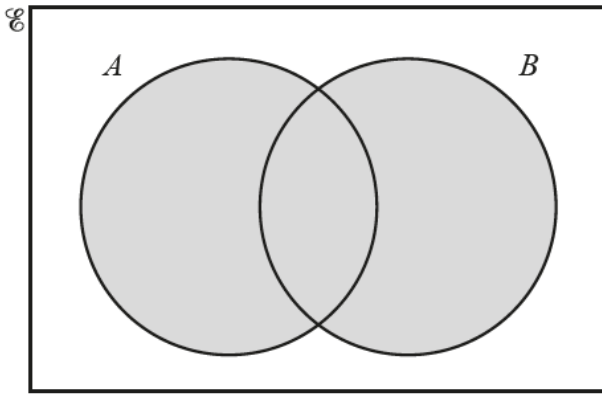
[2]

(b) $\mathcal{E} = \{x : x \text{ is a natural number} \leqslant 15\}$
$F = \{x : x \text{ is a factor of } 12\}$
$O = \{x : x \text{ is an odd number}\}$

   (i) Complete the Venn diagram to show the elements of these sets.
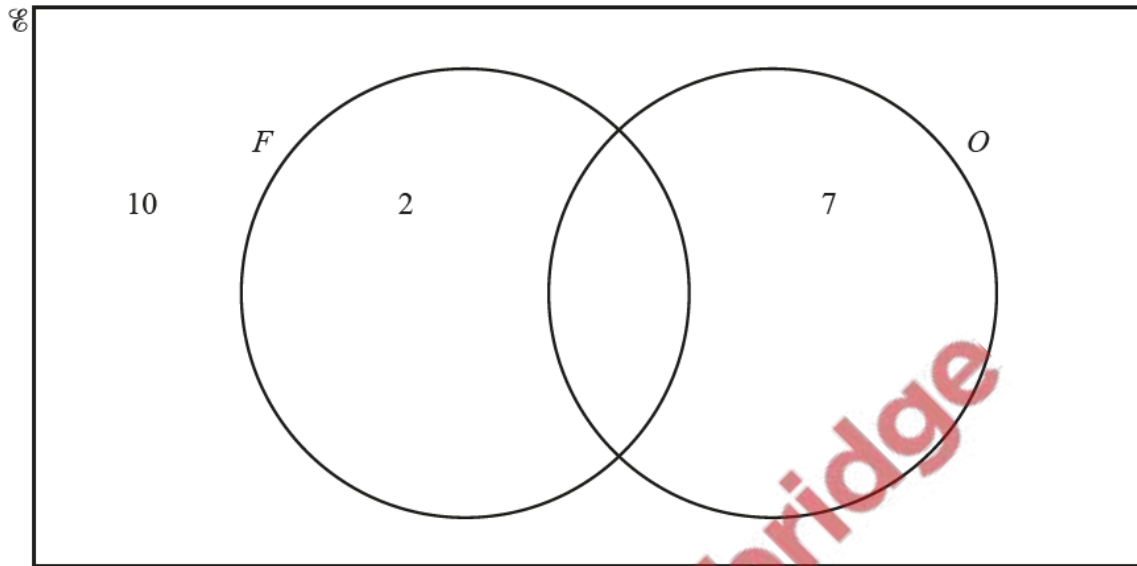
[2]

   (ii) Write down one number that is in set O, but not in set F.

.... [1]

   (iii) Find $\text{n}(F \cup O)$.

.... [1]

   (iv) A number is chosen at random from $\mathcal{E}$.

      Work out the probability that this number is in set O.

.... [1]

(a) Jeremy goes on holiday.
He parks his car in the airport car park from

10 00 on Tuesday 17 July to 17 00 on Saturday 28 July.

The car park charges are shown below.

> Monday to Friday $14 per day
> Saturday and Sunday $8 per day
>
> Part days are charged as full days

Find the total cost of parking his car.

$ .... [3]

(b) At the airport, Jeremy buys a ring for $53 and a watch for $65.

Work out how much change he receives from $120.

$ .... [2]

(c) The plane flies from Melbourne to Tokyo at an average speed of 783 km/h.
The distance from Melbourne to Tokyo is 8352 km.
The plane leaves Melbourne at 09 52 local time.
The local time in Tokyo is 2 hours behind the local time in Melbourne.

Find the local time in Tokyo when the plane arrives.

.... [4]

(d) In Tokyo, Jeremy buys a bracelet for 2050 yen.
The exchange rate is 1 yen = $0.0125 .

Calculate the price of the bracelet in dollars.
Give your answer correct to the nearest dollar.

$ .... [2]

(e) The plane ticket costs $680 plus a tax of 16%.

Find the total cost of this ticket.

$ .... [2]

Alexa, Ben and Chloe own a restaurant.

(a) Alexa records some temperatures.

Fridge 4 °C   Cool box −3 °C   Freezer −19 °C

(i) Find the difference in temperature between the fridge and the cool box.

.... °C [1]

(ii) Find the difference in temperature between the cool box and the freezer.

.... °C [1]

(iii) The temperature in the cold room is 5 °C lower than the fridge.

Find the temperature in the cold room.

.... °C [1]

(b) Alexa, Ben and Chloe share the profits from their restaurant in the ratio 2 : 6 : 7.
One year the restaurant makes a profit of $60 000.

Work out how much each receives.
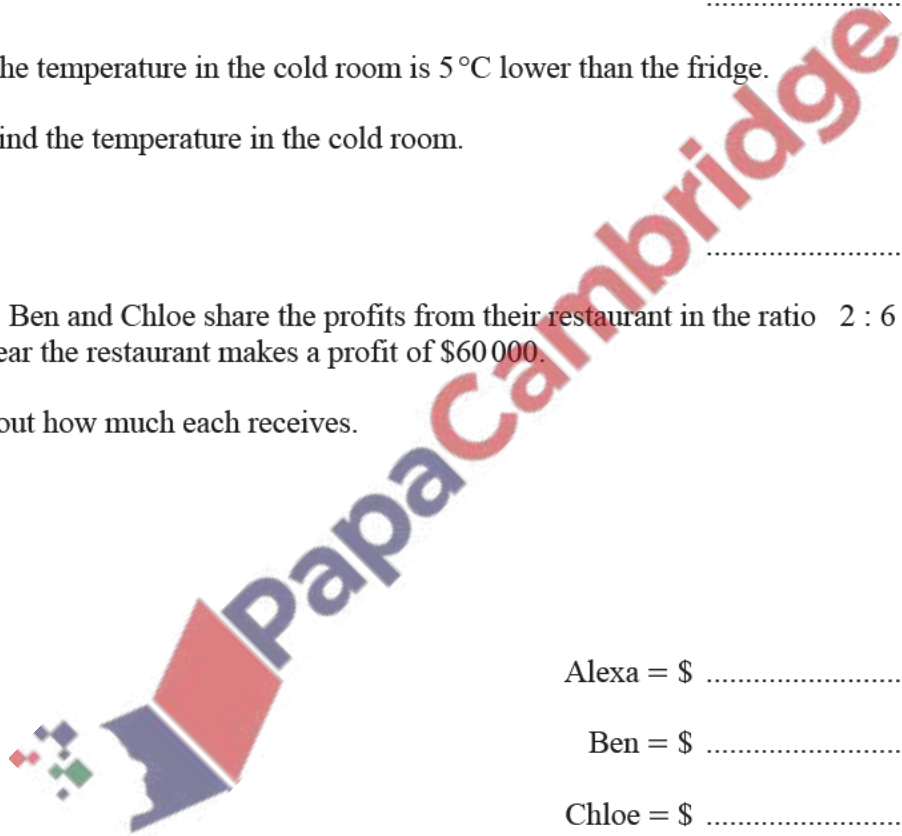
Alexa = $ ....

Ben = $ ....

Chloe = $ .... [3]

(c) They invest $12 000 at a rate of n% per year simple interest.
At the end of 3 years the value of the investment is $12 900.

Find the value of n.

$n =$ .... [3]

(a) (i) Write down a fraction equivalent to $\frac{1}{15}$.

.... [1]

(ii) Find a fraction that is greater than $\frac{1}{15}$ but less than $\frac{2}{15}$.

.... [1]

(b) (i) Write 15% as a decimal.

.... [1]

(ii) Shade 15% of this grid.
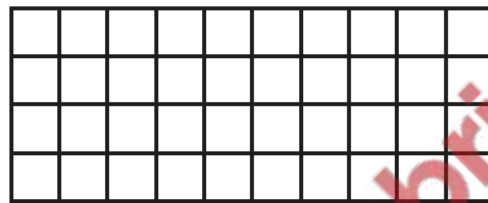
[1]

(c) Write down all the factors of 15.

.... [2]

(d) Find the value of $\sqrt{15}$.
Give your answer correct to 3 decimal places.

.... [2]

(e) (i) Write down the reciprocal of 15.

.... [1]

(ii) Write down the value of 15^0.

.... [1]

(iii) Write 0.015 in standard form.

.... [1]
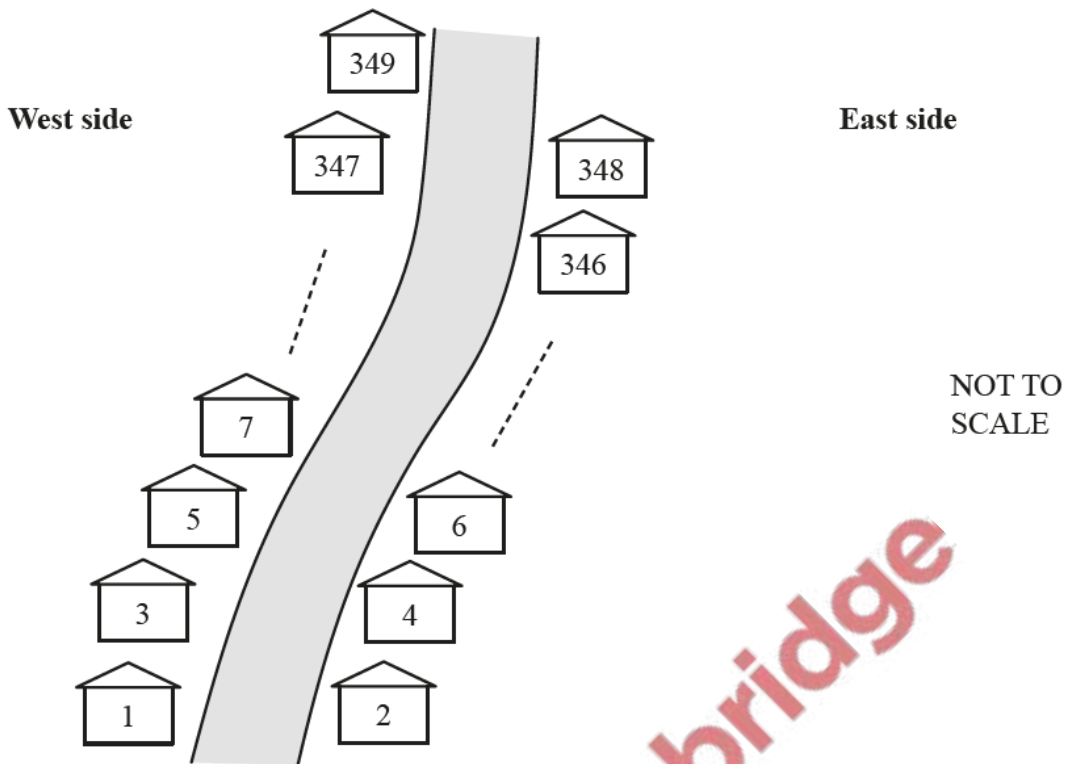
A road has 349 houses on it numbered from 1 to 349.
The diagram shows some of these houses.
The houses on the West side of the road have odd numbers.
The houses on the East side have even numbers.

(a) Put a ring around the numbers in this list that are on the West side.

25   87   126   178   252   329

[1]

(b) On the East side, how many houses are there **between** the house numbered 168 and the house numbered 184?

.... [1]

(c) How many houses on the road have a house number that is a multiple of 39?

.... [2]

173

(d) Tomaz delivers a leaflet to every house on the West side of the road.
He starts at house number 1 and then delivers to each house in order.

(i) Find an expression, in terms of n, for the house number of the nth house he delivers to.

.... [2]

(ii) Work out the house number of the 40th house he delivers to.

.... [1]

(iii) Work out how many houses are on the West side of the road.

.... [2]

(e) Alicia delivers a leaflet to every house on the East side of the road.
She starts at house number 348 and then delivers to each house in order.

(i) Find an expression, in terms of n, for the house number of the nth house she delivers to.

.... [2]

(ii) What is the largest value of n that can be used in your expression?
Give a reason for your answer.

The largest value of n is .... because ....

.... [2]

(a) The Venn diagram shows information about the number of students in a class who like apples (A) and bananas (B).
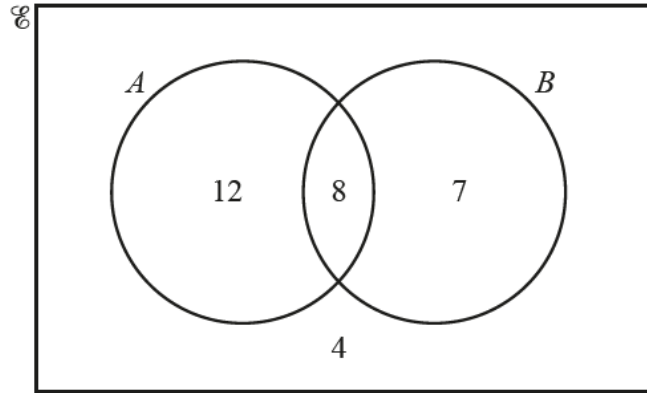
(i) Work out the number of students in the class.

.... [1]

(ii) Work out the number of students who like bananas.

.... [1]

(iii) Work out $n(A \cup B)$.

.... [1]

(iv) How many more students like apples than like bananas?

.... [1]

(v) One of the students is chosen at random.

Find the probability that this student does not like apples and does not like bananas.

.... [1]

(b) The mass, *m* grams, of a banana is 115 g, correct to the nearest 5 g.

Complete the statement about the value of *m*.

.... $\leqslant m <$ .... [2]

(c) Six of the students bring an apple to school one day.
The list shows the mass of each apple, correct to the nearest gram.

<div align="center">

82   94   78   103   88   82

</div>

(i) Find

(a) the mode,

.... g [1]

(b) the range,

.... g [1]

(c) the median.

.... g [2]

(ii) Another student, Toni, also brings an apple to school.
The mean mass of the 7 apples is 89 g.

Work out the mass of Toni's apple.

.... g [3]

(b) 100 g of cereal contains 360 kilocalories.
100 ml of milk contains 45 kilocalories.
For breakfast Sasha has 35 g of cereal with 180 ml of milk.

Work out the number of kilocalories Sasha has for breakfast.

.... kcal [3]

(c) A shop sells cereal in boxes A, B and C.

Box A
500 g
$1.73

Box B
750 g
$2.60

Box C
1.25 kg
$4.35

NOT TO SCALE

Work out which box is the best value.
You must show all your working.

Box .... [3]

(a) In 2018, Gretal earned $32 000.

(i) She paid tax of 24% on these earnings.

Work out the amount she paid in tax in 2018.

$ .... [2]

(ii) In 2019, Gretal's earnings increased by 7%.

Work out her earnings in 2019.

$ .... [2]

(b) Gretal invests $5000 at a rate of 2% per year compound interest.

Calculate the value of her investment at the end of 3 years.

$ .... [2]

(c) One month, Gretal spent a total of $360 on presents.
She spent $\frac{1}{5}$ of this total on presents for her parents.
She spent $\frac{2}{3}$ of the remaining money on presents for her friends.
She spent the rest of the money on presents for her sisters.

Calculate the percentage of the $360 that she spent on presents for her sisters.

.... % [4]

(d) Arjun earned $36 515 in 2019.
This was an increase of 9% on his earnings in 2018.

Work out his earnings in 2018.

$ .... [2]

(e) Arjun and Gretal each pay rent.
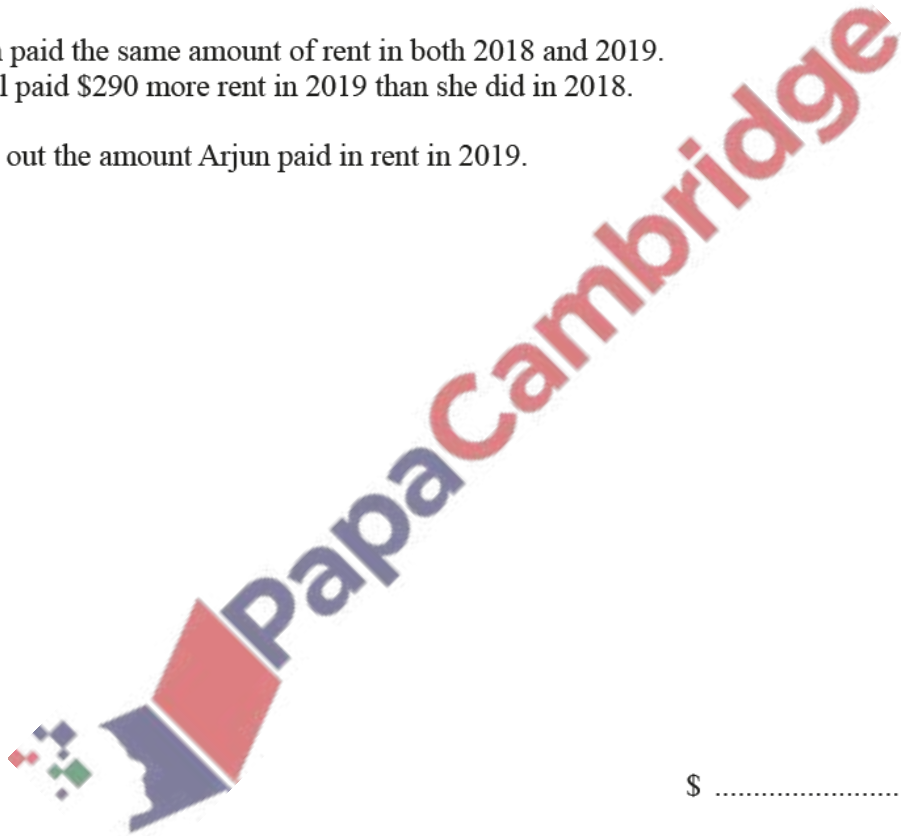
In 2018, the ratio of the amount each paid in rent was Arjun : Gretal = 5 : 7.
In 2019, the ratio of the amount each paid in rent was Arjun : Gretal = 9 : 13.

Arjun paid the same amount of rent in both 2018 and 2019.
Gretal paid $290 more rent in 2019 than she did in 2018.

Work out the amount Arjun paid in rent in 2019.

$ .... [4]

x is an integer.

$\mathscr{E} = \{x : 41 \leqslant x \leqslant 50\}$

$A = \{x : x \text{ is an odd number}\}$

$B = \{x : x \text{ is a multiple of } 3\}$

$C = \{x : x \text{ is a prime number}\}$

(a) Complete the Venn diagram to show this information.
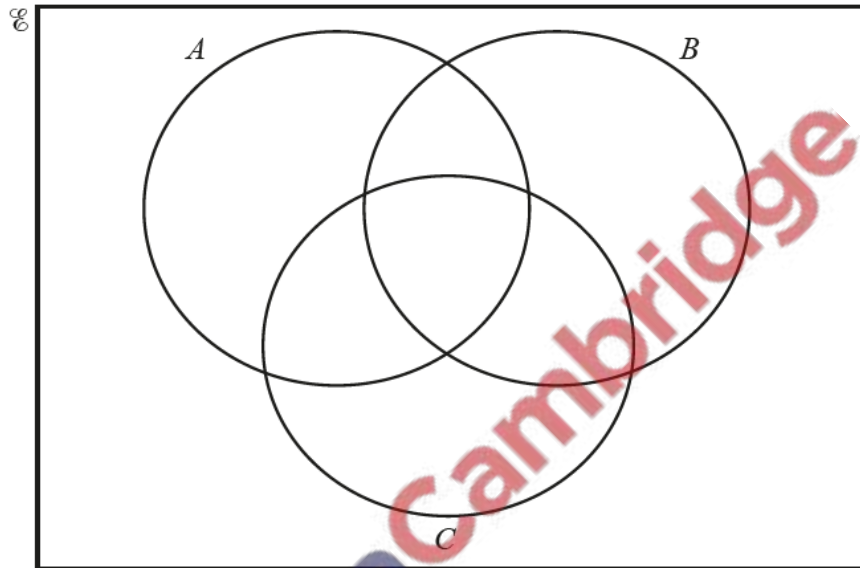
[3]

(b) List the elements of

    (i) $A \cap C$,

    .... [1]

    (ii) $(B \cup C)'$.

    .... [1]

(c) Find $n(A \cap B \cap C)$.

.... [1]

(a) **(i)** Divide $24 in the ratio 7 : 5.

$ .... , $ .... [2]

(ii) Write $24.60 as a fraction of $2870.
Give your answer in its lowest terms.

.... [2]

(iii) Write $1.92 as a percentage of $1.60 .

.... % [1]

(b) In a sale the original prices are reduced by 15%.

(i) Calculate the sale price of a book that has an original price of $12.
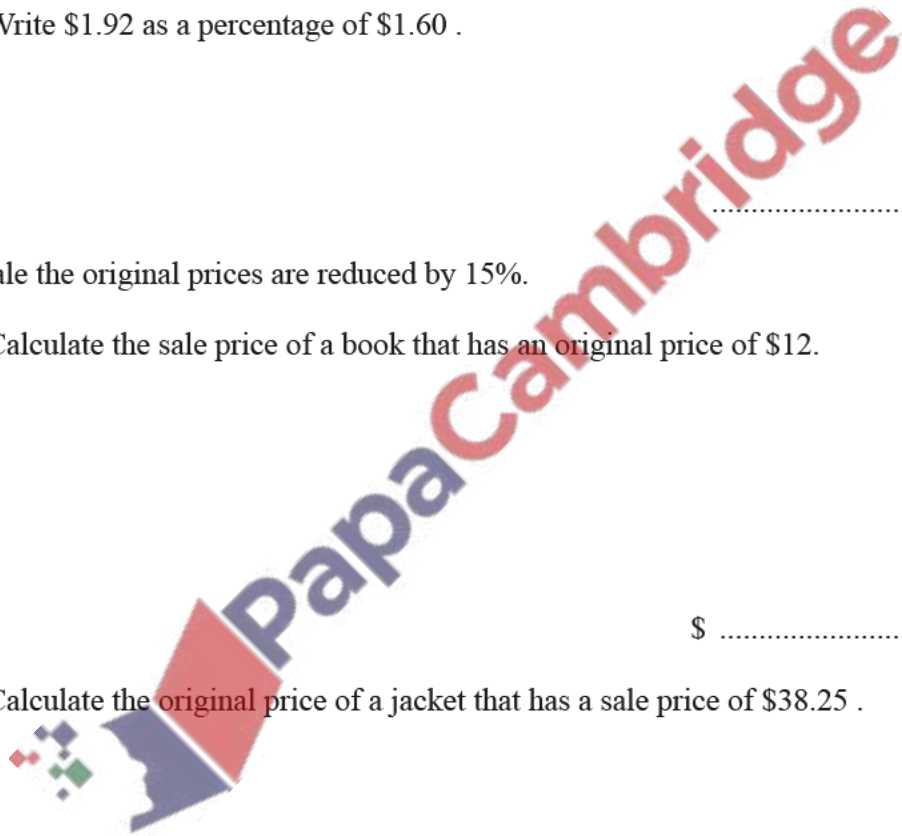
$ .... [2]

(ii) Calculate the original price of a jacket that has a sale price of $38.25 .

$ .... [2]

(c) (i) Dean invests $500 for 10 years at a rate of 1.7% per year simple interest.

Calculate the total interest earned during the 10 years.

$ .... [2]

(ii) Ollie invests $200 at a rate of 0.0035% **per day** compound interest.

Calculate the value of Ollie's investment at the end of 1 year.
[1 year = 365 days.]
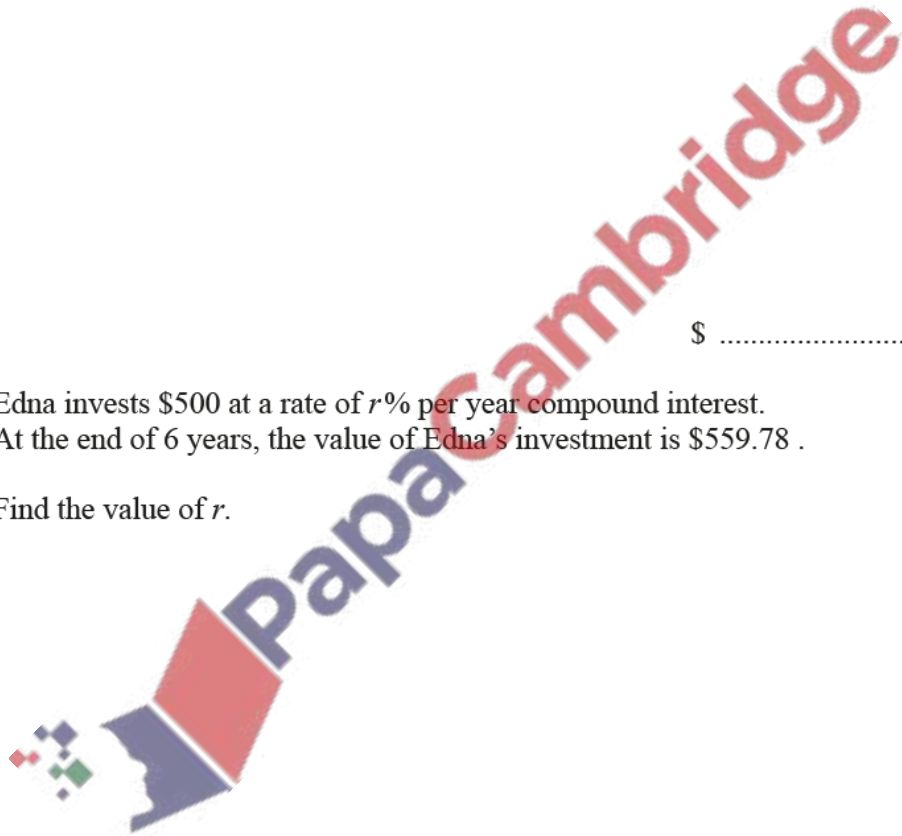
$ .... [2]

(iii) Edna invests $500 at a rate of r% per year compound interest.
At the end of 6 years, the value of Edna's investment is $559.78 .

Find the value of r.

$r =$ .... [3]

(a)

```
┌─────────────────────────┐
│     Campsite fees       │
│      (per day)          │
│                         │
│  Tent  ............ $15.00 │
│  Caravan ....... $25.00  │
└─────────────────────────┘
```

The sign shows the fees charged at a campsite.
Today there are 54 tents and 18 caravans on the site.

Calculate the fees charged today.

$ .... [2]

(b) In September the total income at the campsite was $37 054.
This was a decrease of 4.5% on the total income in August.

Calculate the total income in August.

$ .... [2]

(c) The visitors to the campsite today are in the ratio

men : women = 5 : 4   and   women : children = 3 : 7.

(i) Calculate the ratio   men : women : children   in its simplest form.

.... : .... : .... [2]

(ii) Today there are 224 children at the campsite.

Calculate the total number of men and women.

.... [3]

(d) The space allowed for each tent is a rectangle measuring 8 m by 6 m, each correct to the nearest metre.

Calculate the upper bound for the area of the space allowed for each tent.

.... m^2 [2]

(e) The value of the campsite has increased exponentially by 1.5% every year since it opened 30 years ago.

Calculate the value of the campsite now as a percentage of its value 30 years ago.

.... % [2]