1. Nov/2021/Paper_23/No.1

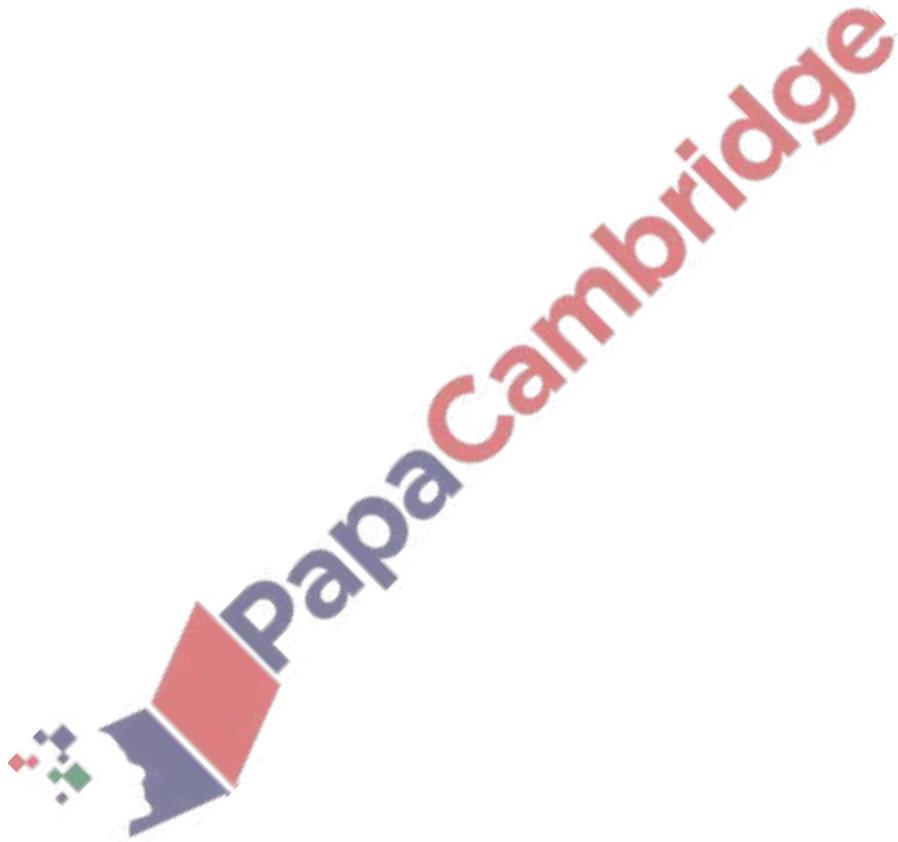Write 25 g as a percentage of 125 g.

.... % [1]
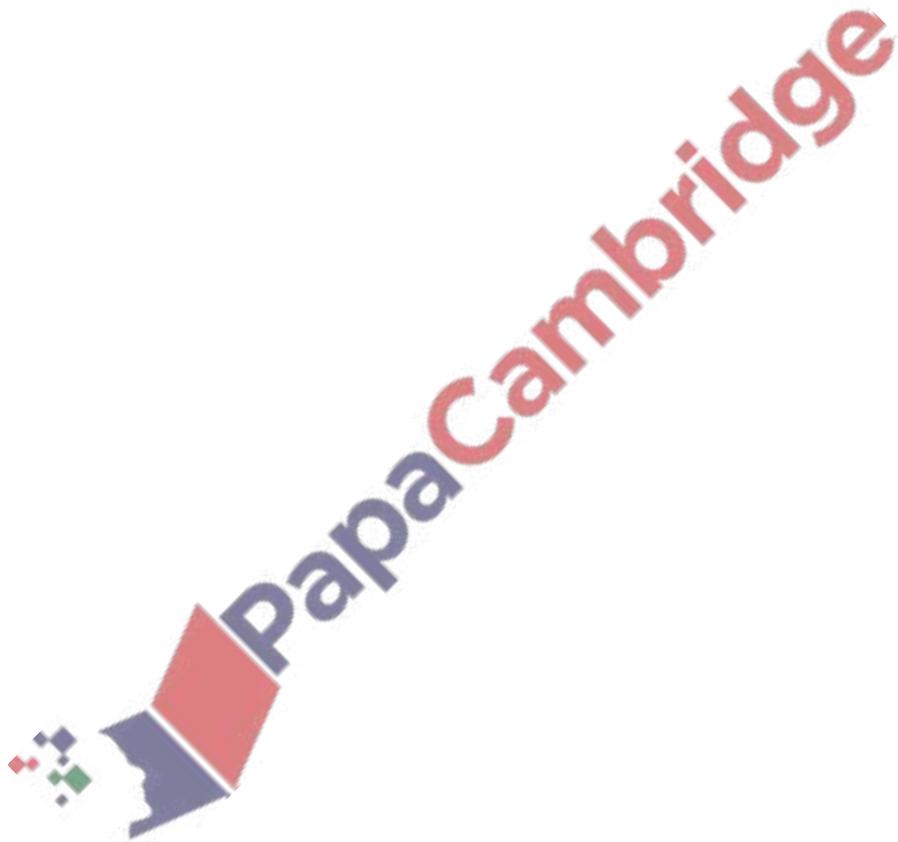
$$11 \qquad 13 \qquad 15 \qquad 17 \qquad 19$$

From this list, write down the number that is both a prime number and a factor of 78.

.... [1]

3.

(a)   =   ≠   >   <

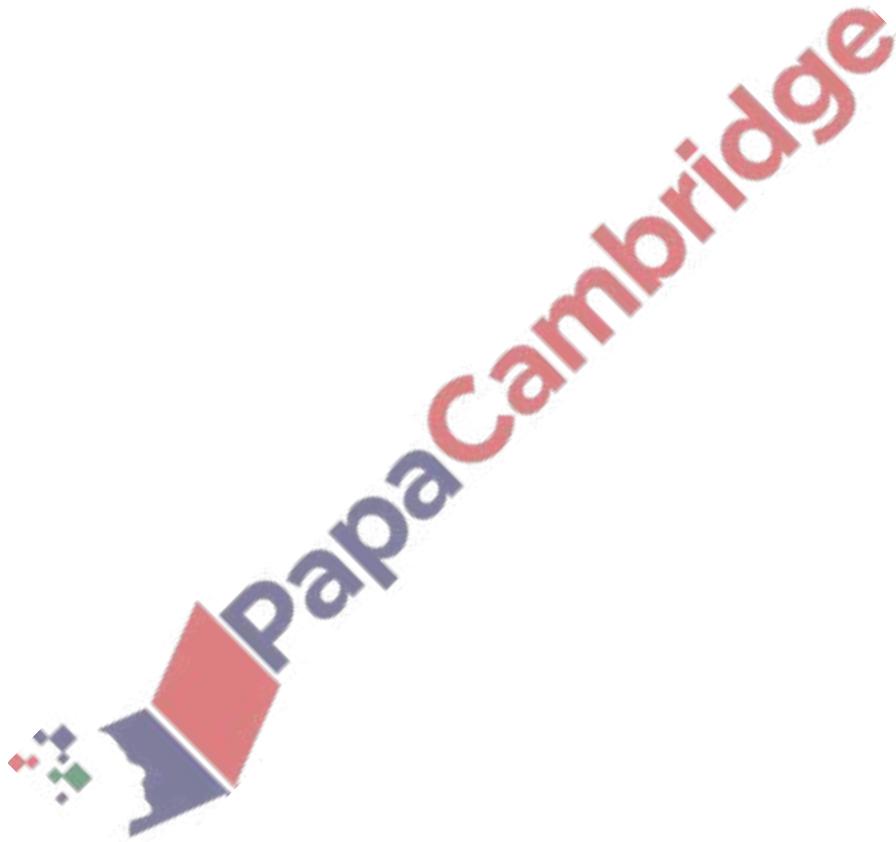Put a ring around each of the symbols that make this statement correct.

$$0.5 \text{ .... } 5\%$$ [1]

(b) Insert one pair of parentheses to make this statement correct.

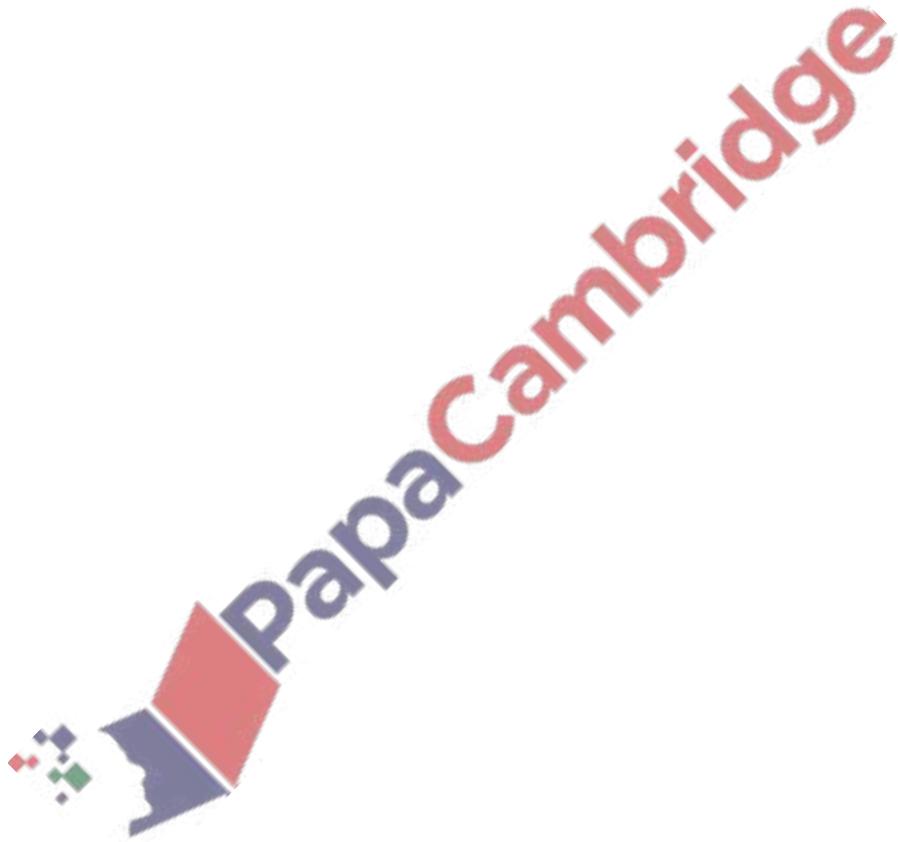$$7 - 3 - 1 + 2 = 7$$ [1]

4.

Nina changes 350 euros into dollars when the exchange rate is 1 euro = $1.10 .
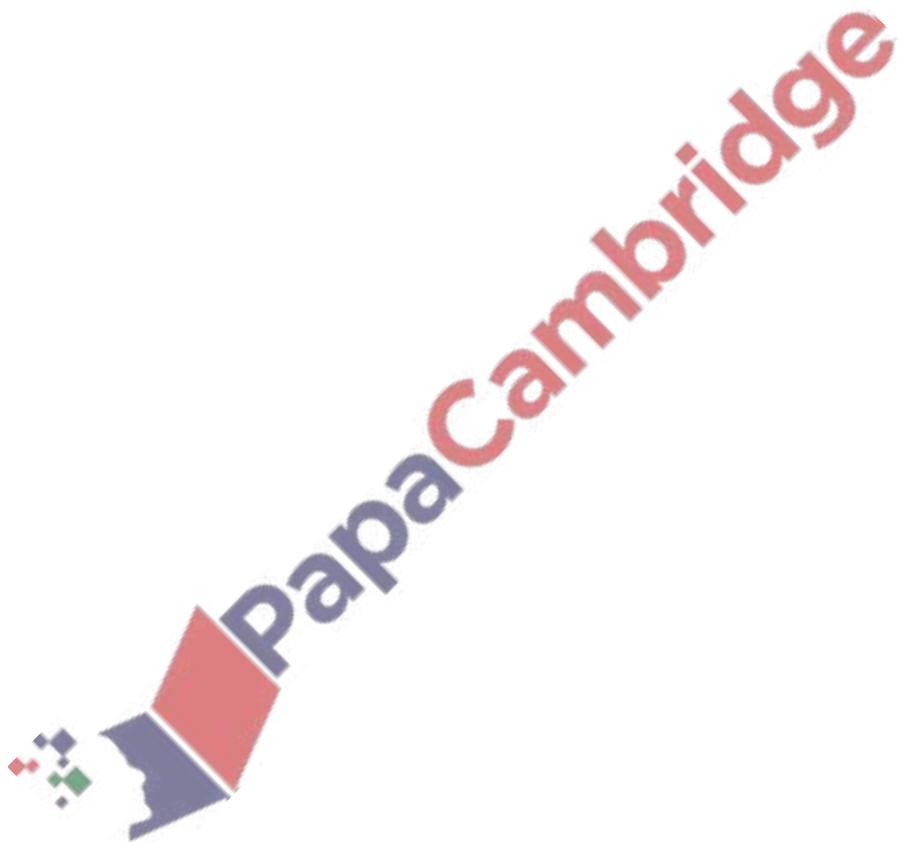
Work out the amount Nina receives.

$ .... [1]

5.

Marek buys a computer for $400.
He sells it at a loss of 15%.

Work out the selling price of this computer.

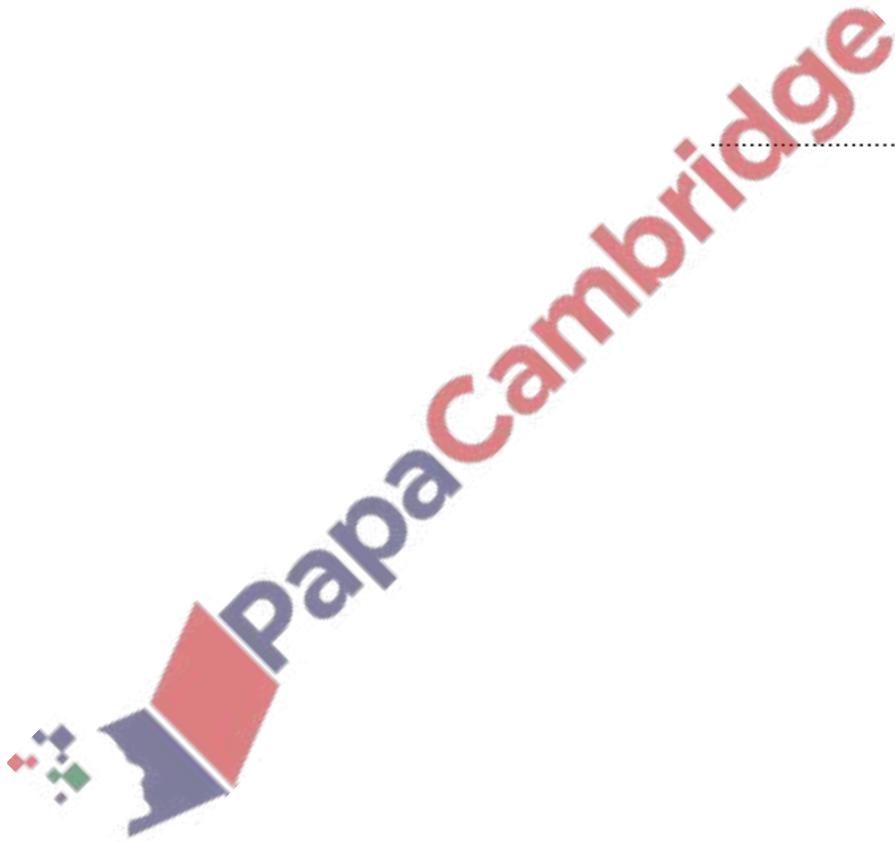$ .... [2]

6.

Beatrice walks $8\,\text{km}$ at a speed of $4\,\text{km/h}$ and then $9\,\text{km}$ at a speed of $3\,\text{km/h}$.

Work out Beatrice's average speed for the whole journey.

.... km/h [3]

7.

Simplify $\sqrt{50}$.

.... [1]

8.
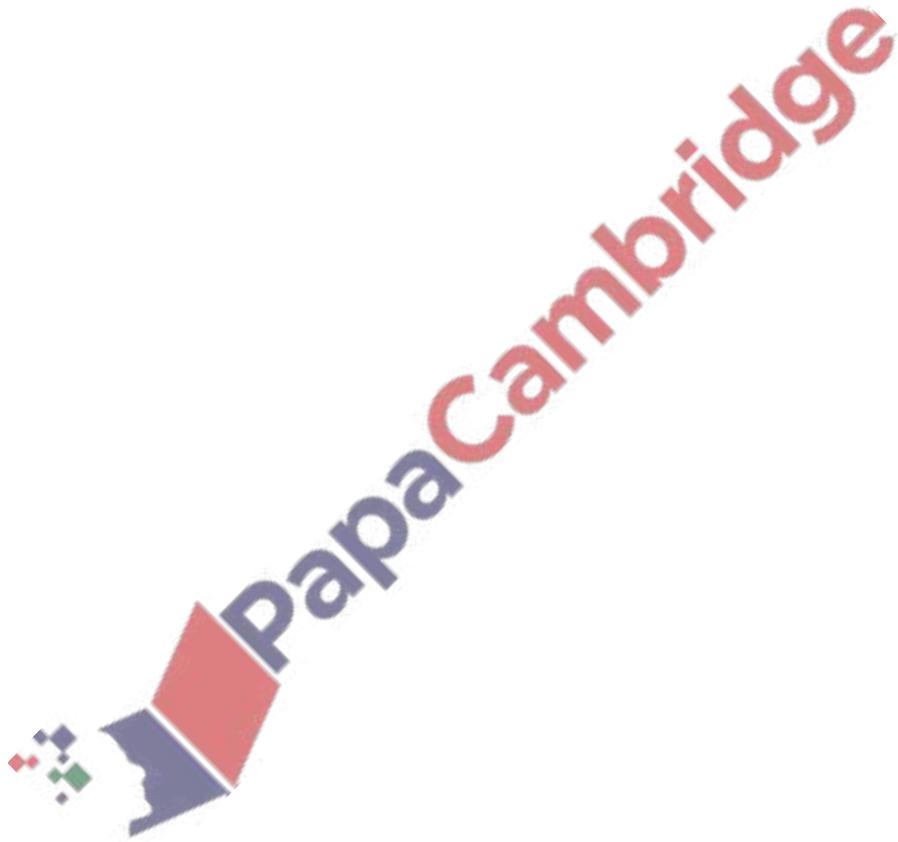
Work out $\dfrac{11}{12} + \dfrac{3}{4}$.

Give your answer as a mixed number in its simplest form.
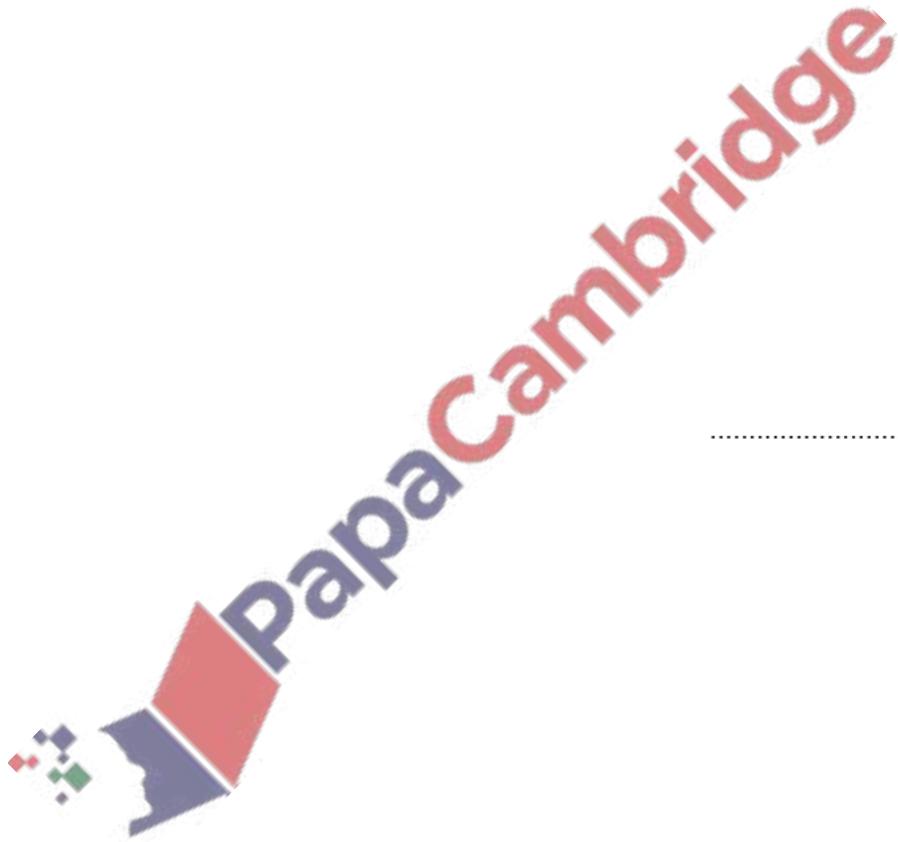
.... [3]

Work out 0.04^2.
Give your answer in scientific notation.

.... [2]
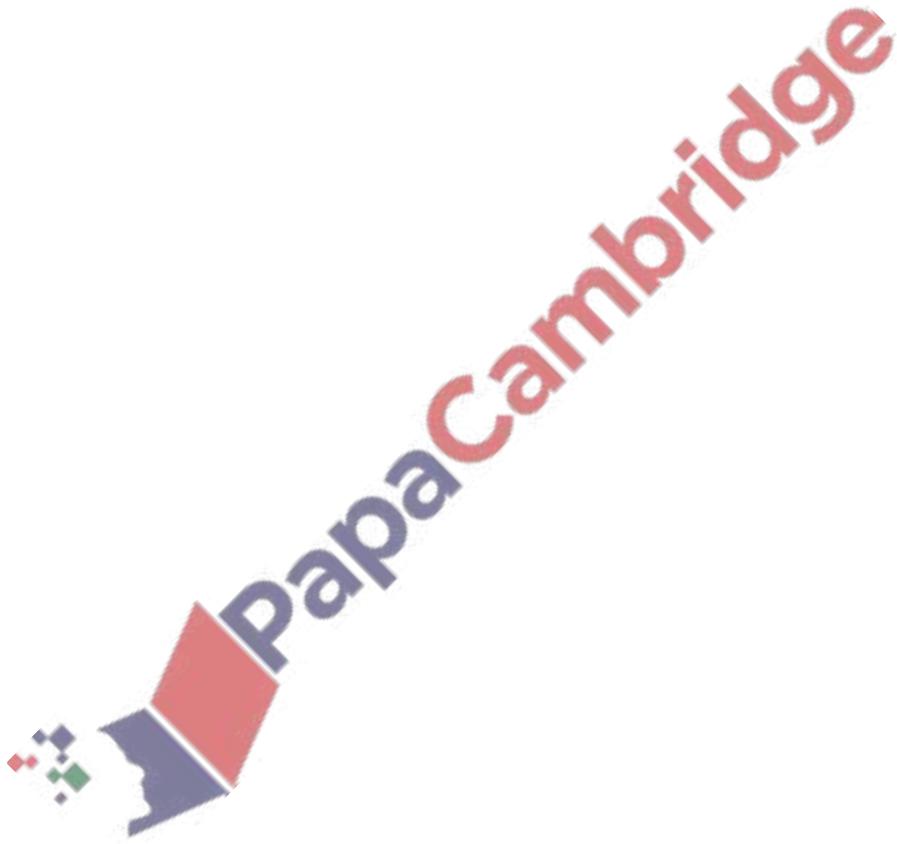
(a) Evaluate 3^4.

.... [1]

(b) $\left(4+\sqrt{5}\right)^2 = p+q\sqrt{5}$

Find the value of p and the value of q.

$p = $ ....

$q = $ .... [2]

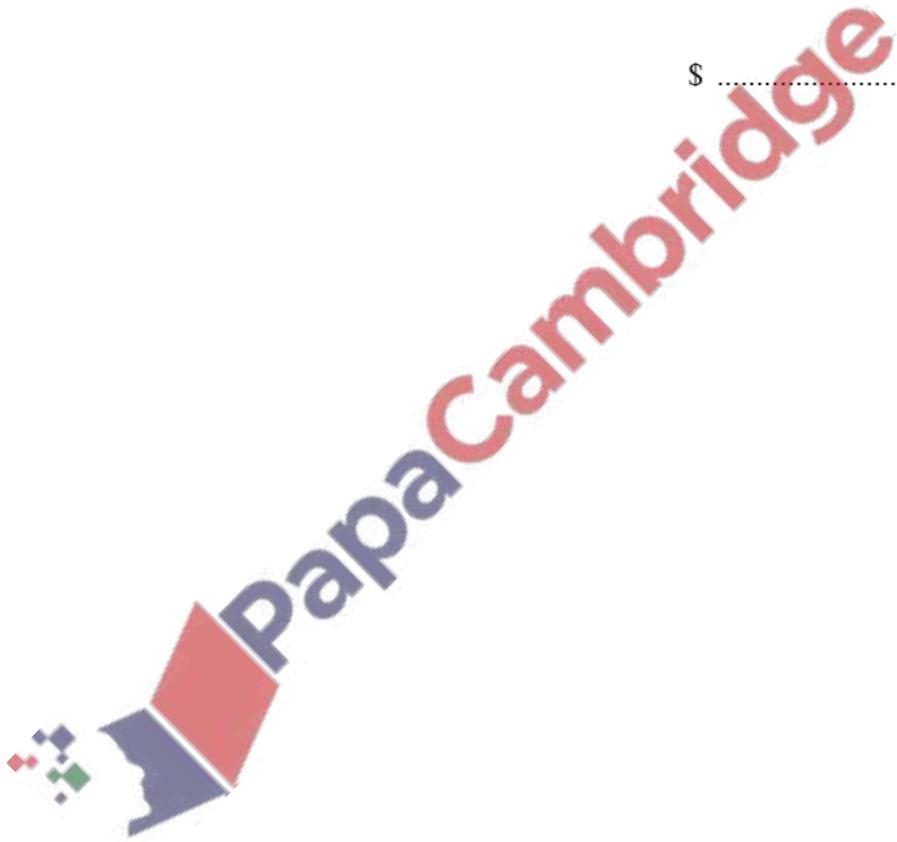**11.**
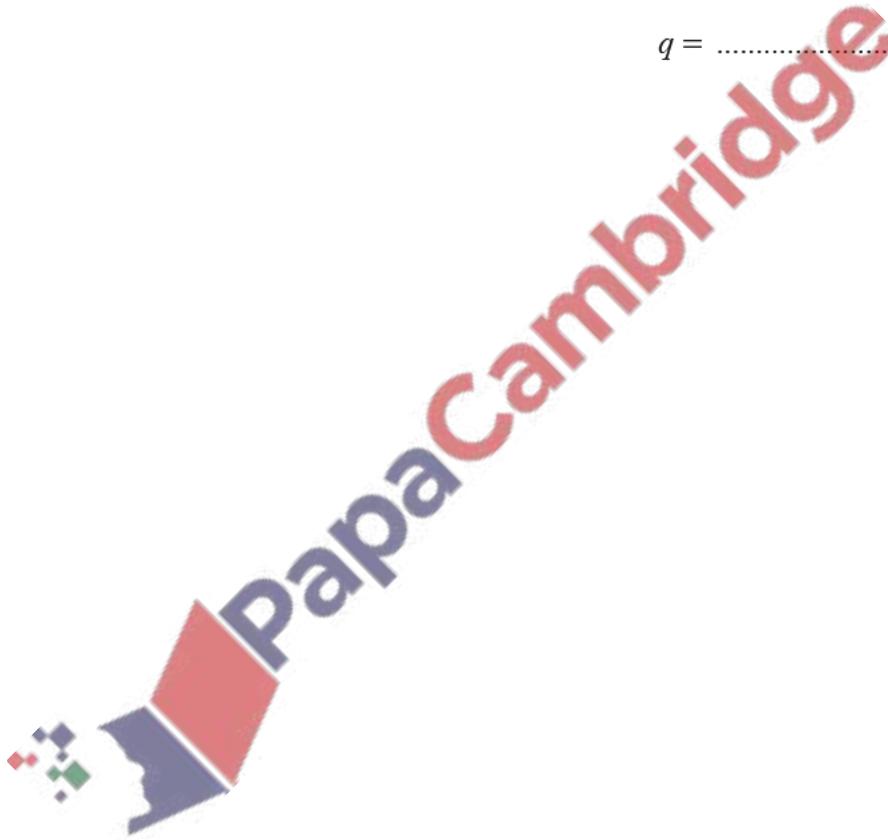
The cost of a train journey is increased by 20% to a new cost of $84.

Work out the original cost of the train journey.

$ .... [2]
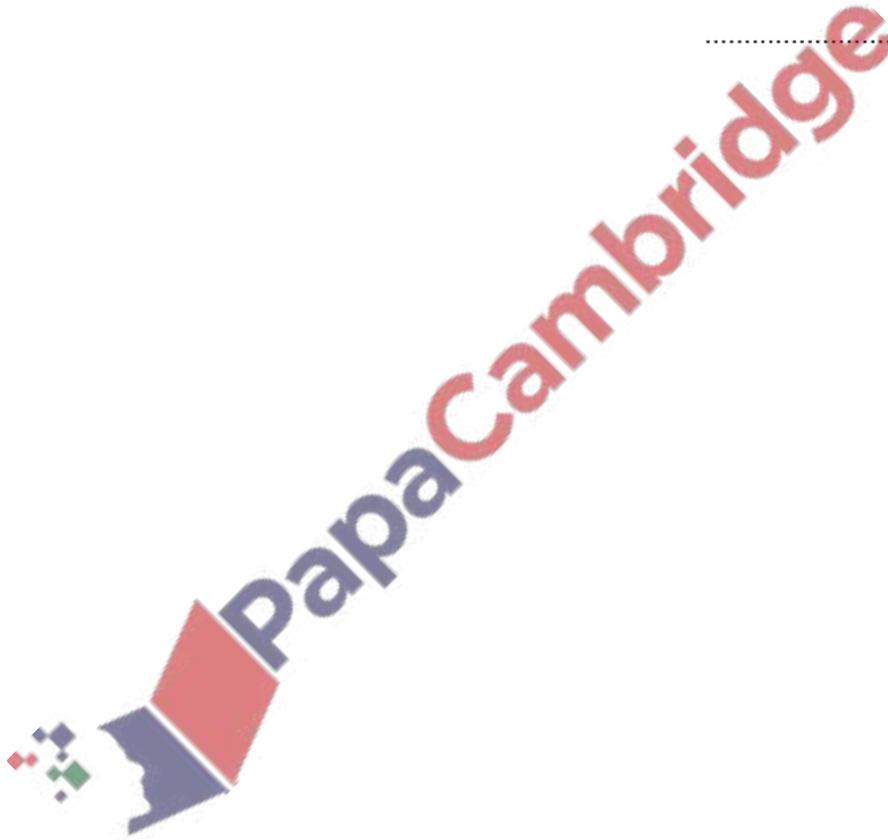
Jo and Mo share $26.
Jo receives $10 more than Mo.

Find the ratio   Jo's money : Mo's money.
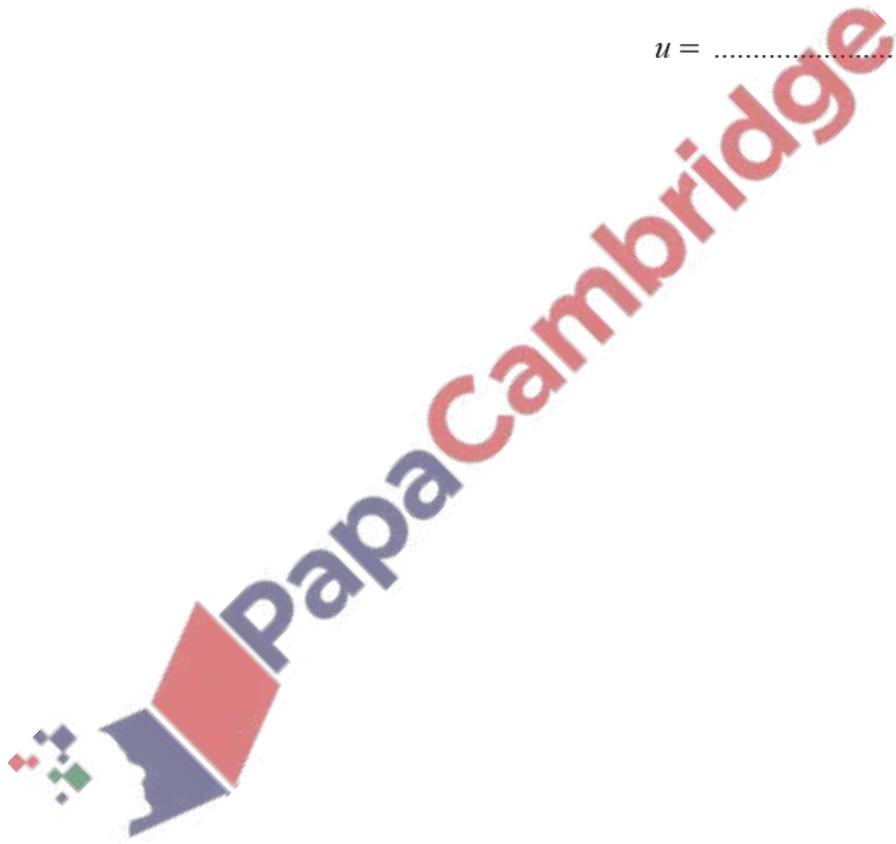Give your answer in its simplest form.

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

13.

x varies inversely as the square root of u.
When $u = 9$, $x = 2$.

Find u when $x = 12$.

$u = $ .... [3]

(a) $500 is invested at a rate of 3% per year.

Calculate the total interest earned at the end of 7 years when

(i) simple interest is paid,

$ .... [2]

(ii) compound interest is paid.

$ .... [3]

(b) Each year the value of a car decreases by 10% of its value at the beginning of the year.
The value now is $6269.40 .

Calculate the value of the car 3 years ago.
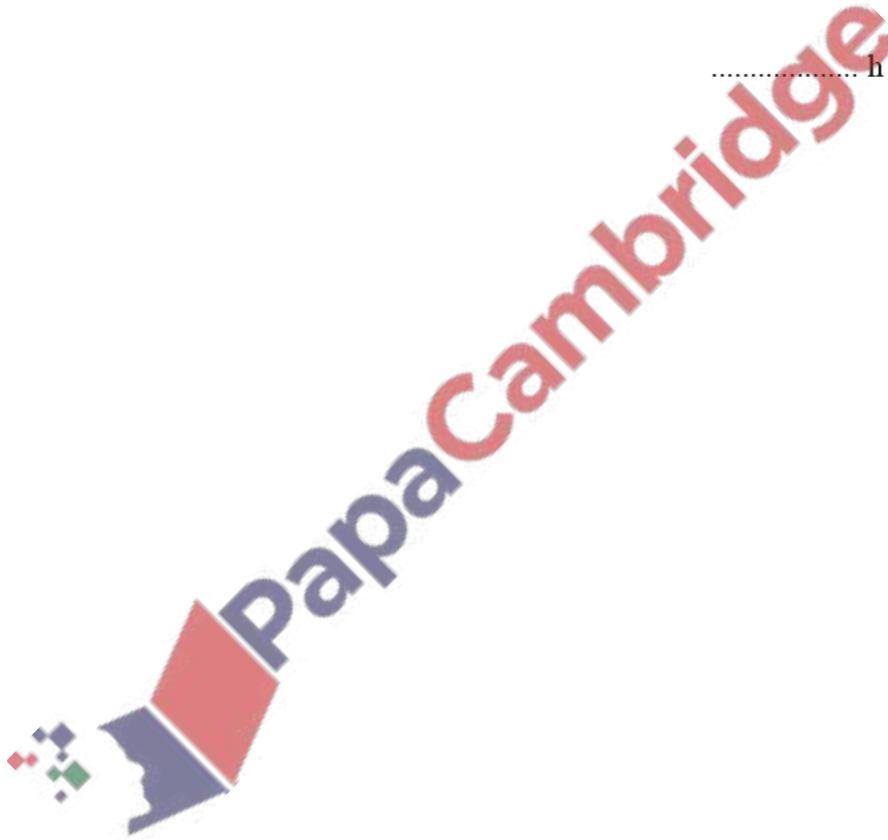
$ .... [3]

The distance between two towns is $300\,\mathrm{km}$.

(a) Calculate the average speed of a car that takes 4 hours to travel this distance.

.... km/h [1]

(b) Calculate the time taken by another car that travels at an average speed of $90\,\mathrm{km/h}$.
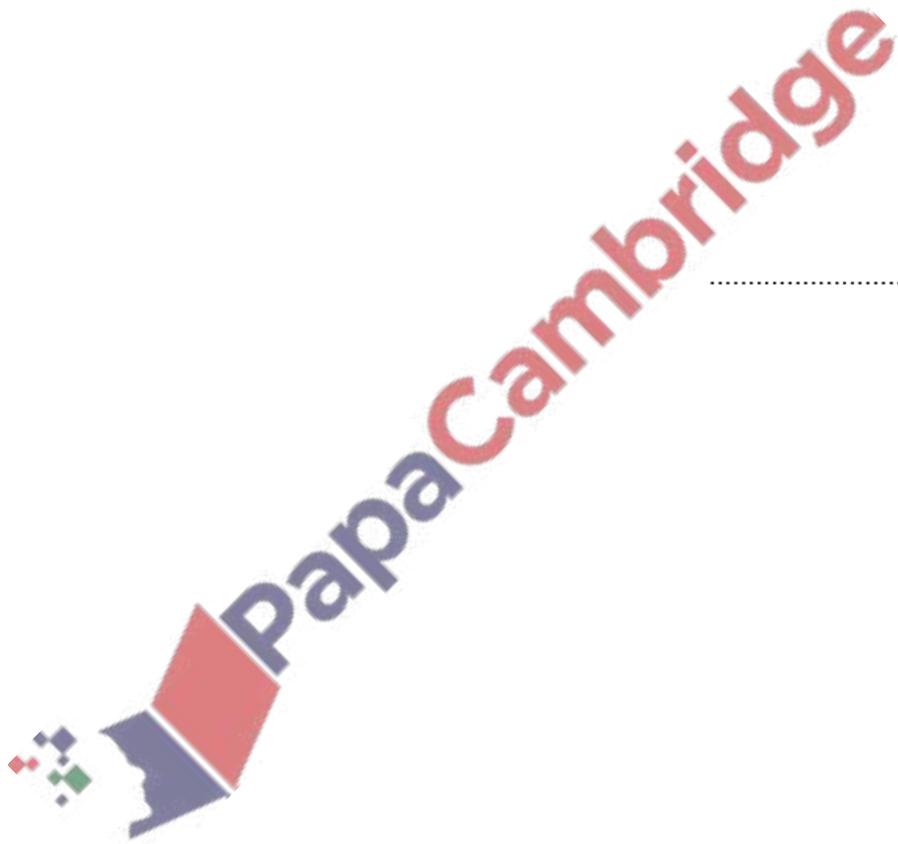Give your answer in hours and minutes.

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

Work out $1\frac{3}{8} - \frac{5}{6}$.

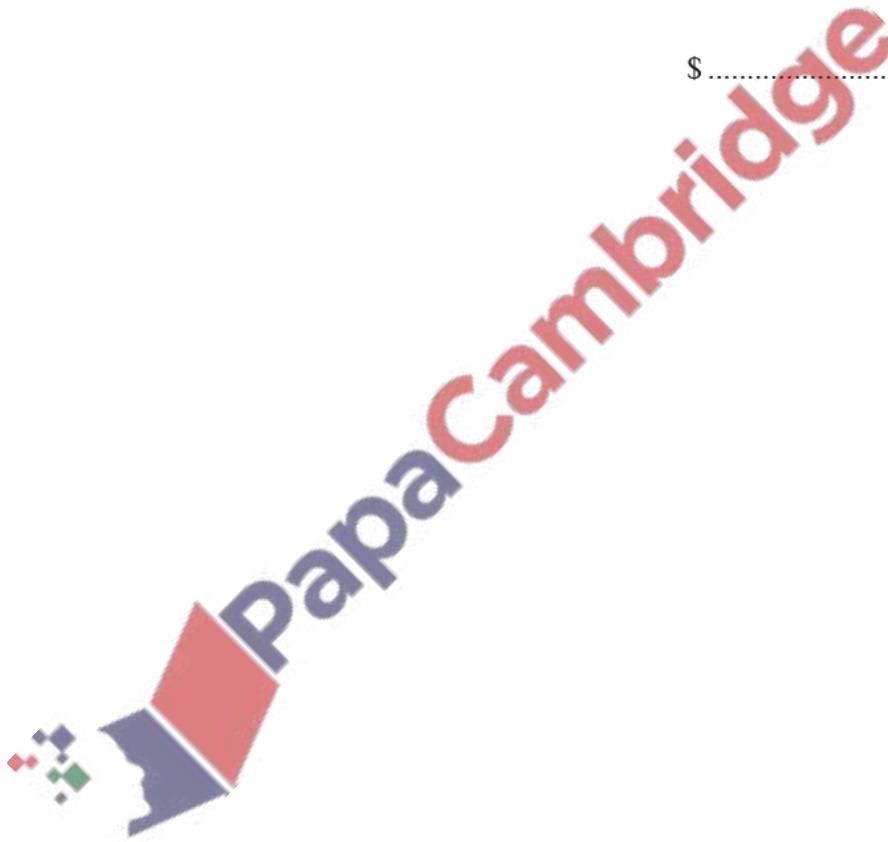Give your answer as a fraction in its simplest form.

.... [3]

Annie invests $8000 at a rate of 1% per year compound interest.

Work out the value of her investment at the end of 2 years.

$ .... [2]

On a map, a lake has an area of $32\,\text{cm}^2$.
The scale of the map is $1\,\text{cm}$ represents $0.2\,\text{km}$.

Calculate the actual area of the lake.
Give your answer in km^2.

.... km^2 [2]

19.
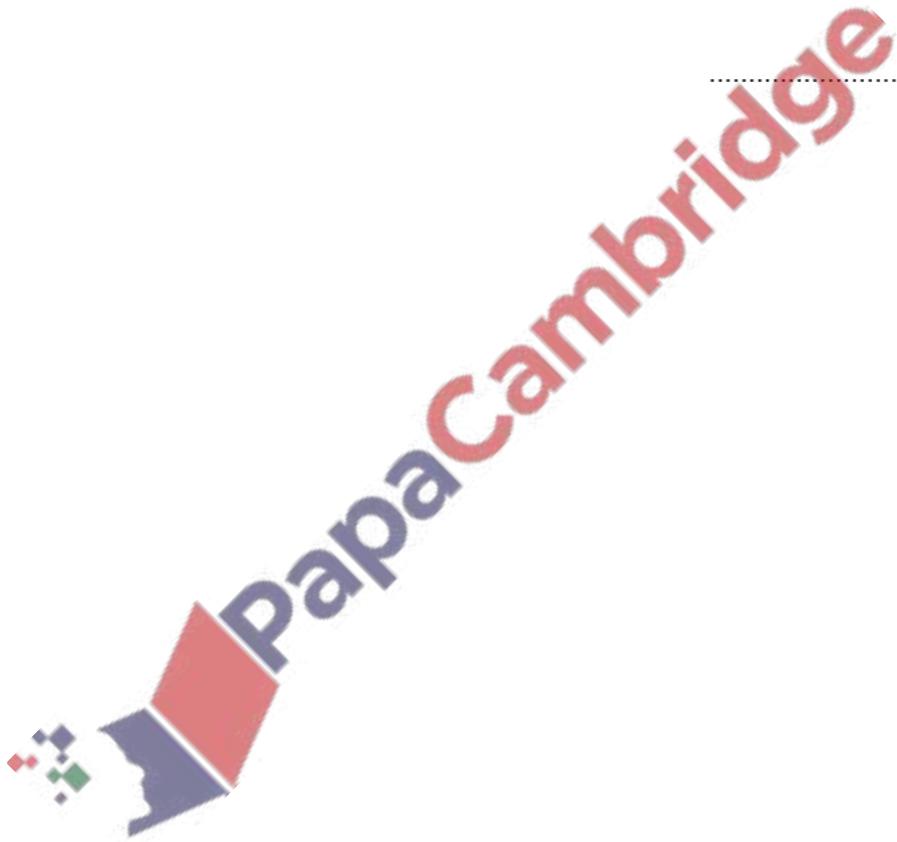
y varies directly as the square root of $(x-3)$.
When $x = 28$, $y = 20$.

Find y when $x = 39$.

$y =$ .... [3]
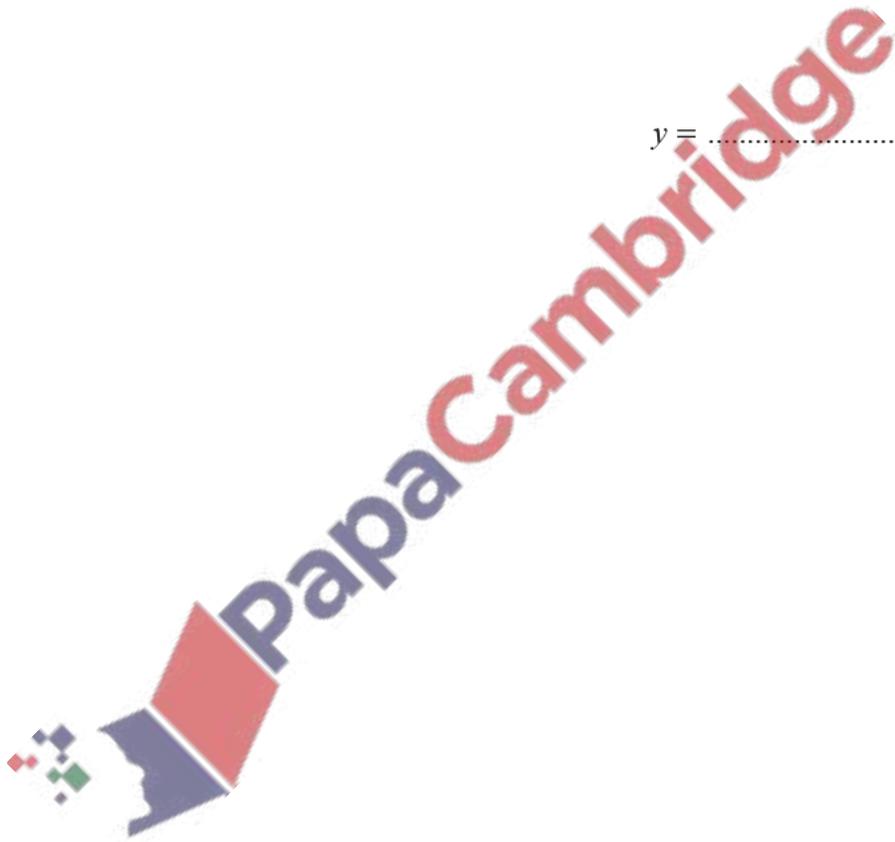
(a) The total cost of a taxi journey is calculated as

- $0.50 per kilometer

plus

- $0.40 per minute.

(i) Calculate the total cost of a journey of 32 km that takes 30 minutes.

$ .... [2]
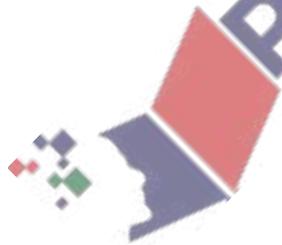
(ii) The total cost of a journey of 100 km is $98.

Show that the time taken is 2 hours.

[3]

(b) Three taxi drivers travel a total of 8190 km in the ratio 5 : 2 : 7.

Calculate the distance each driver travels.

Driver 1 .... km

Driver 2 .... km
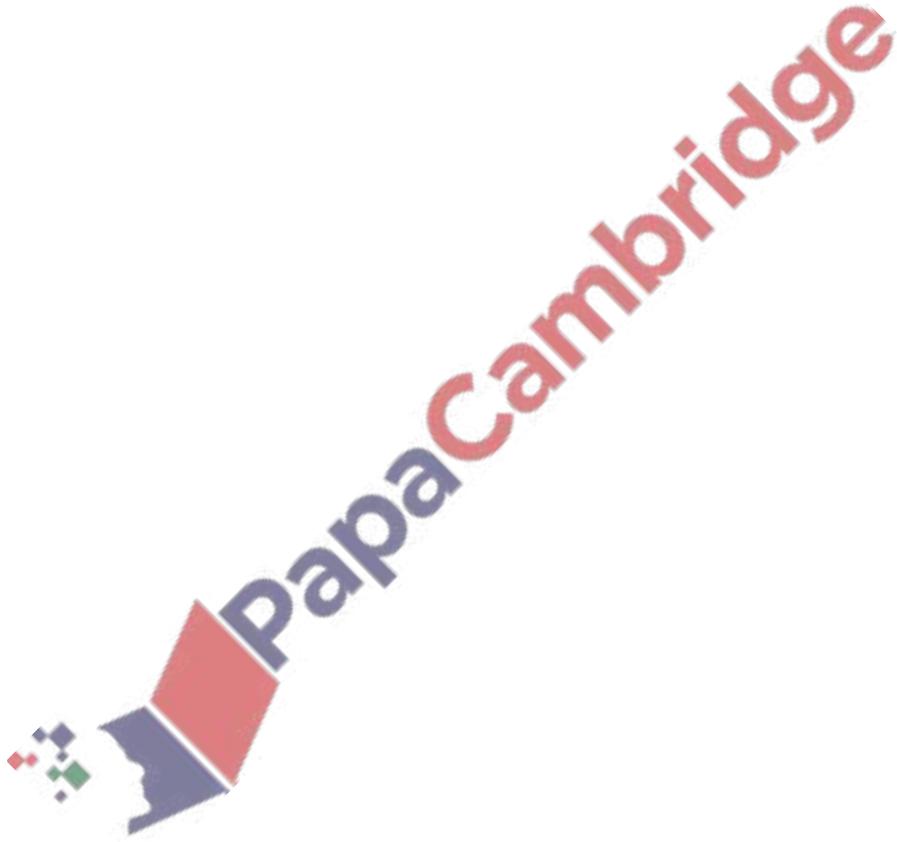
Driver 3 .... km [3]

(c) After midnight, the cost of any taxi journey increases by 45%.
One journey costs $84.10 after midnight.

Calculate the cost of the same journey before midnight.

$ .... [2]

(a) The exchange rate is 1 euro = $1.142 .

   (i) Johann changes $500 into euros.

      Calculate the number of euros Johann receives.
      Give your answer correct to the nearest euro.

                                                               .... euros [2]

   (ii) Johann buys a computer for $329.
      The same computer costs 275 euros.

      Calculate the difference in cost in dollars.

                                            $ .... [2]

(b) Lucy spends $\frac{3}{8}$ of the money she has saved this month on a book that costs $5.25 .
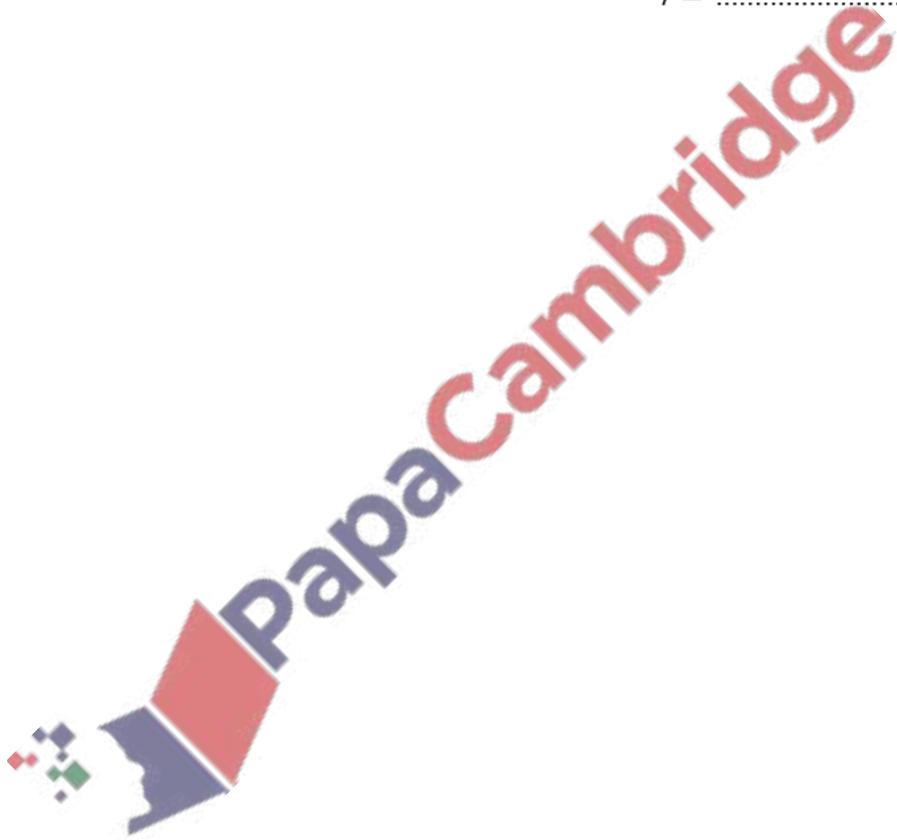
    Calculate how much money Lucy has saved this month.

                                            $ .... [2]
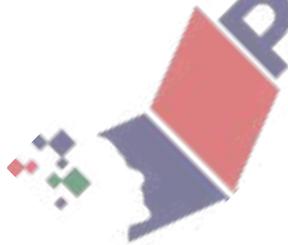
(c) Kamal invests \$6130 at a rate of r% per year compound interest.
The value of his investment at the end of 5 years is \$6669.

Calculate the value of r.

$r =$ .... [3]

(a) (i) Write 0.00307 in scientific notation.

.... [1]

(ii) Work out $7.8 \times 10^{200} + 7.8 \times 10^{201}$, giving your answer in scientific notation.

.... [2]
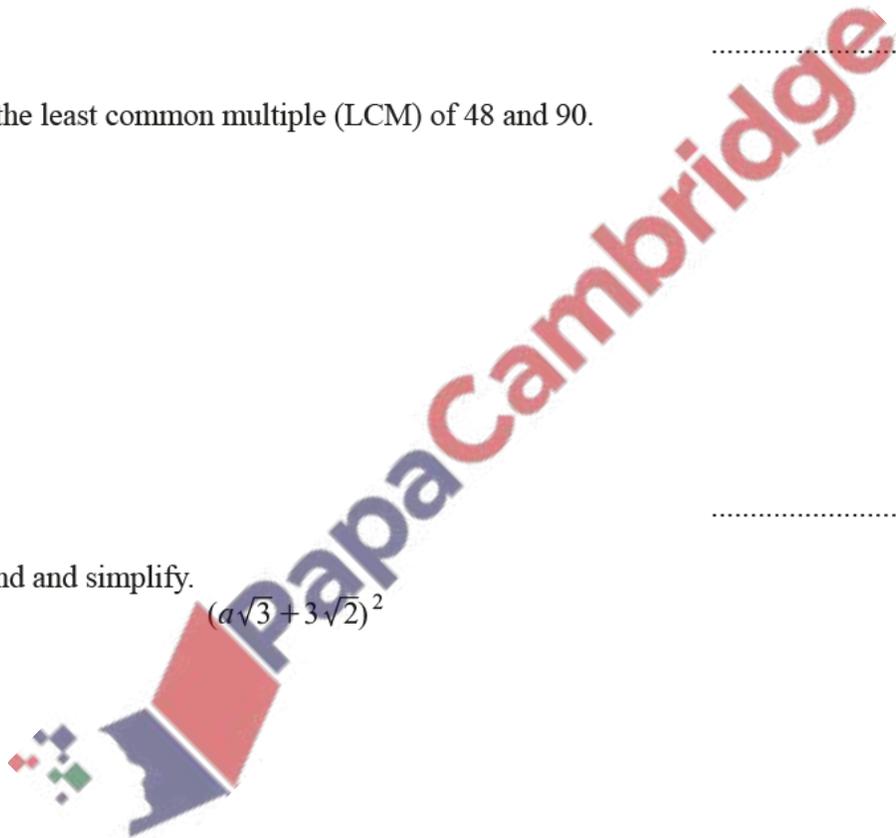
(b) Find the least common multiple (LCM) of 48 and 90.

.... [2]

(c) Expand and simplify.

$$(a\sqrt{3} + 3\sqrt{2})^2$$

.... [3]

(d) Simplify $\sqrt{175} + \sqrt{700}$.
You must show all your work.

.... [2]