1 If Shabir has 250ml of soup for her lunch, how many kilocalories of energy will she get?

SOUP
100ml = 59kcal

.... [2 marks]

2 Leon changes £500 to euros at the rate shown and goes to France on holiday.

| £1 = 1.29 euros | £1 = 187.99 Japanese yen |
| £1 = 1.56 US dollars | £1 = 97.04 Indian rupees |

(a) How many euros does he take on holiday? .... [1 mark]

Leon spends €570.

(b) He changes his remaining euros on the ferry where the exchange rate is £1 : €1.33

How much in pounds sterling does he take home? .... [2 marks]

3 James' dairy herd of 80 cattle produces 1360 litres of milk per day.

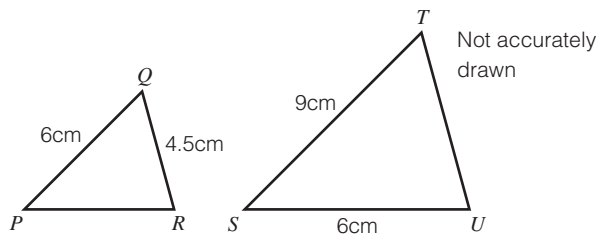**(a)** If James buys another 25 cattle and is paid 30p/litre, what will his annual milk income be? .... [4 marks]

(b) If 6 tonnes of hay will last 80 cattle for 10 days, how long will the same amount of hay last the increased herd? [2 marks]

....

4 Triangles *PQR* and *STU* are similar.

Find the missing lengths *PR* and *TU*. [4 marks]

PR = ...

TU = ...

6cm, 4.5cm, 9cm, 6cm
Not accurately drawn

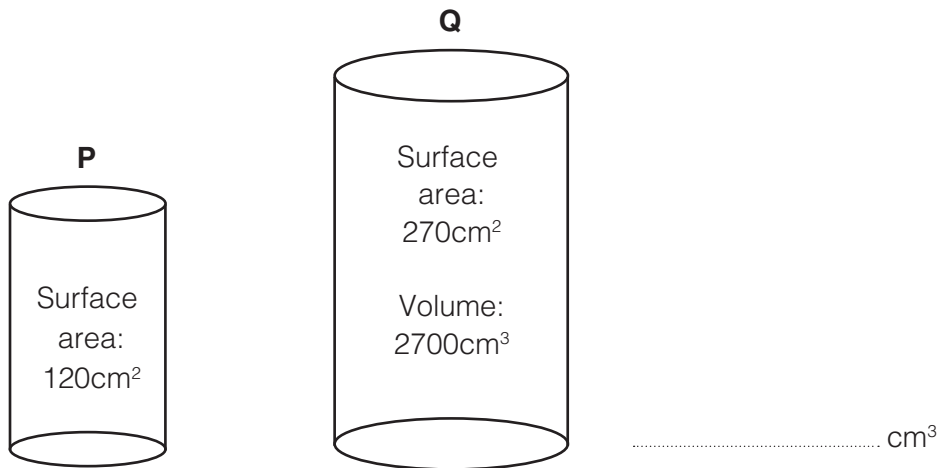**5** Two similar cylinders P and Q have surface areas of 120cm² and 270cm².

If the volume of Q is 2700cm³, what is the volume of P? [3 marks]

Q

P

P — Surface area: 120cm²

Q — Surface area: 270cm²
Volume: 2700cm³

.... cm³

Score   /18

For more help on this topic, see Letts GCSE Maths Higher Revision Guide pages 50–51.

1 **(a)** Peter invests £10 000 in a savings account which pays 2% compound interest per annum.

How much will his investment be worth after four years? [2 marks]

....

(b) Paul invests £10 000 in company shares.
In the first year the shares increase in value by 15%.
In the second year they increase by 6%.
In the third year they lose 18% of their value.
In the fourth year the shares increase by 1%.

What is his investment worth after four years? .... [3 marks]

2 Lazya invests £6500 at 3% compound interest for three years. She works out the first year's interest to be £195. She tells her family she will earn £585 over three years.

Is she right? Show working to justify your decision. [3 marks]

....

....

3 This graph shows a tank being filled with water. 🖩

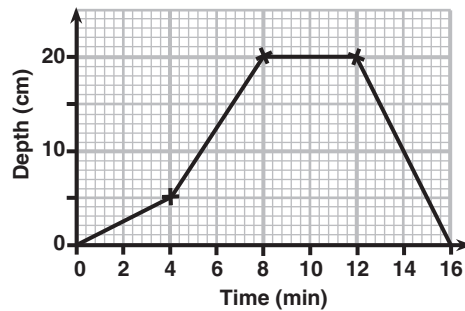**(a)** How deep is the water when the tank is full?

.... [1 mark]

(b) Between what times is the tank filling fastest?

.... [1 mark]

(c) Work out the rate of decrease of water level as the tank empties.

.... [1 mark]

Depth (cm) vs Time (min) graph

4 This graph shows the distance travelled by a cyclist for the first 10 seconds of a race.

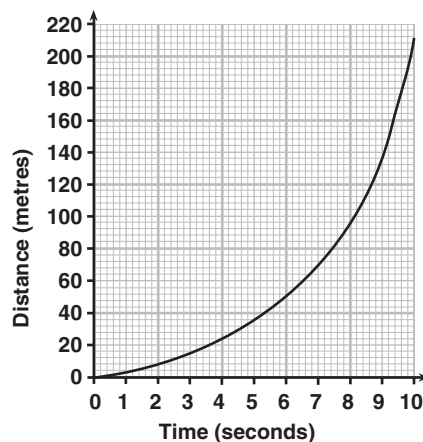**(a)** Work out the cyclist's average speed for the first 10 seconds.

.... [2 marks]

(b) Estimate the actual speed at 5 seconds.

.... [3 marks]

Distance (metres) vs Time (seconds) graph

Score **/16**

For more help on this topic, see Letts GCSE Maths Higher Revision Guide pages 52–53.

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Rates of Change

Module 23

14. Here is a square and an isosceles triangle.
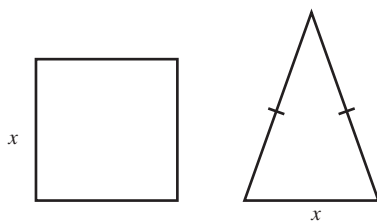
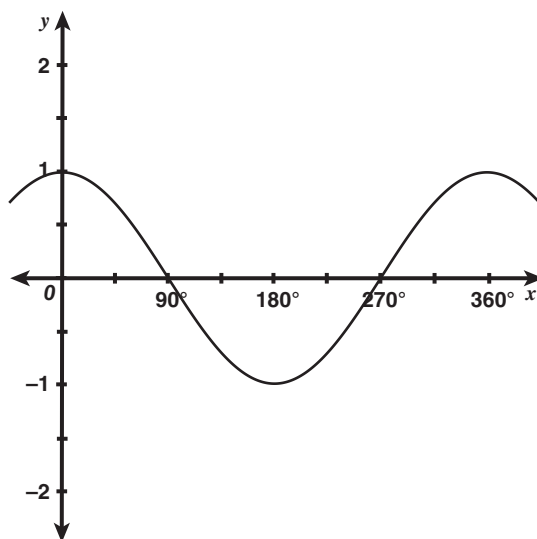The length of each of the equal sides of the triangle is 3cm greater than the side of the square.

(a) If the perimeters of the two shapes are equal, find the value of x. **[3]**

....

(b) Show that the height of the triangle is equal to the diagonal of the square. **[3]**

....

....

....

....

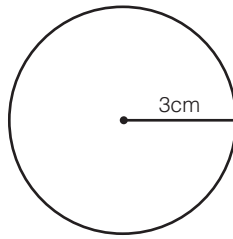**15.** The graph of $y = \cos x$ is shown for $0° \leqslant x \leqslant 360°$

On the same grid, sketch and label the graphs of

(a) $y = -\cos x$ **[2]**

(b) $y = \cos x + 1$ **[2]**
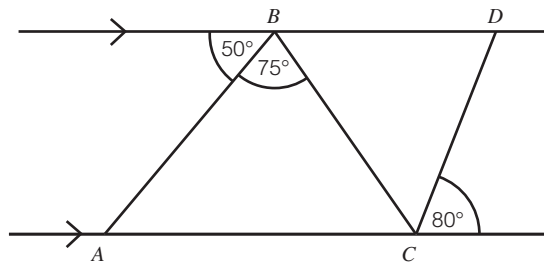
16. Calculate the circumference of this circle.

Leave your answer in terms of π. **[2]**

.... cm

17. Calculate angle BCD, giving your reasons. **[3]**

....

....

....

....

18. Work out the next term of this quadratic sequence:

−2   3   14   31 **[2]**

....