Nat 5 Revision E - Paper 2 (Based on Credit 2013)

1. A snail crawls 3 kilometres in 16 days.

What is the average speed of the snail in metres per second?

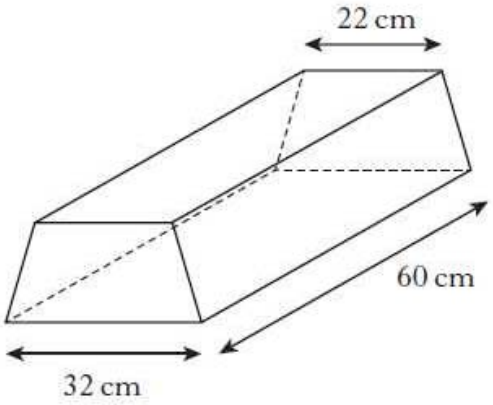
Give your answer **in scientific notation correct to 2 significant figures.** 4

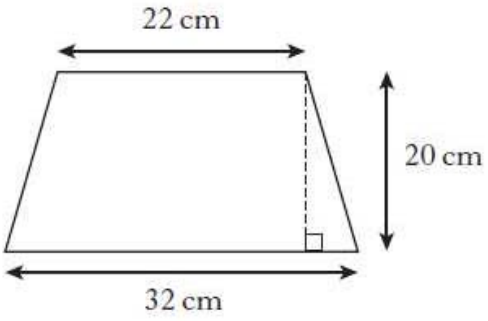
2. Solve the equation

$$2x^2 + 7x - 3 = 0.$$

Give your answers **correct to 1 decimal place.** 4

3. A concrete block is in the shape of a prism.





The cross section of the prism is a trapezium with dimensions as shown.

(*a*) Calculate the area of the cross section. 3

(*b*) Calculate the volume of the concrete block. 1

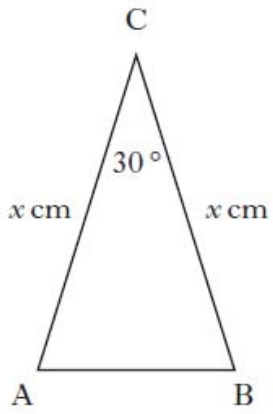
4. Last year, 1296 learner drivers from "Topflight" school of motoring passed their driving test.

This was 72% of those who sat their driving test from Topflight. 3

How many **failed** their driving test?

5. ABC is an isosceles triangle with angle ACB = 30 °.

AC = BC = x centimetres.

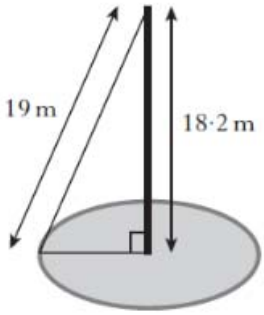


The area of triangle ABC is 9 square centimetres.

Calculate the value of x. 3

6. A mobile phone mast, 18·2 metres high, stands vertically in the centre of a circle.

It is supported by a wire rope, 19 metres long, attached to the ground at a point on the circumference of the circle, as shown.



Calculate the circumference of the circle. **3**

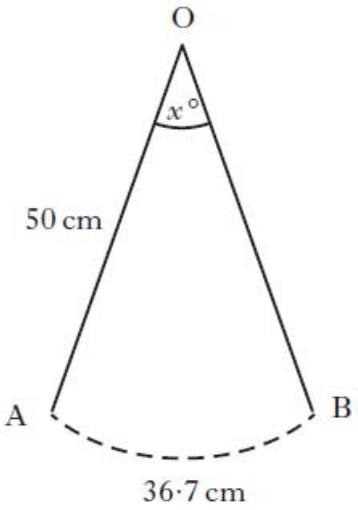
7. Jack weighs 94 kilograms.

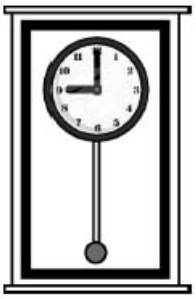
On the 1st of January, he starts a diet which is designed t
by 7% per month.

During which month should he achieve his target weight of 73 kilograms?

Show all your working. **4**

8. As the pendulum of a clock swings, its tip moves through an arc of a circle.





The length of the pendulum is 50 centimetres.
The length of the arc is 36·7 centimetres.

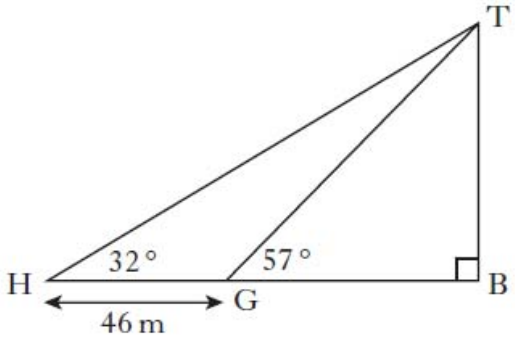
Calculate $x°$, the angle through which the pendulum swings. **3**

9. In triangle THB:

- angle TBH = 90°
- angle THB = 32°.

G is a point on HB.

- angle TGB = 57°
- GH = 46 metres.



Calculate the length of TB. **4**

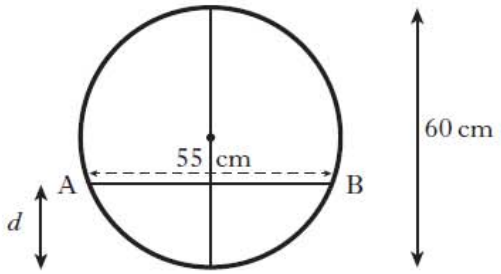
10. A function is given by the formula, $f(x) = 4 \times 2^x$.

(*a*) Evaluate $f(3)$. **2**

(*b*) Given that $f(m) = 4$, find the value of m. **2**

11. Water flows through a horizontal pipe of diameter 60 centimetres.

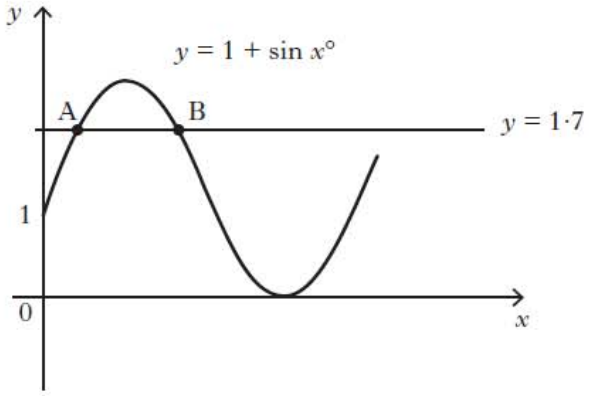
The surface width, AB, of the water is 55 centimetres.



(*a*) Calculate the depth, *d*, of the water in the pipe. **4**

(*b*) What other depth of water would give the same surface width? **1**

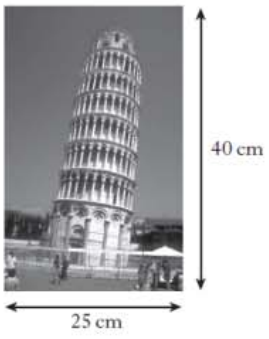
12. Part of the graph of $y = 1 + \sin x°$ is shown in the diagram below.



The line $y = 1{\cdot}7$ is drawn. It cuts the graph of $y = 1 + \sin x°$ at A and B as shown.

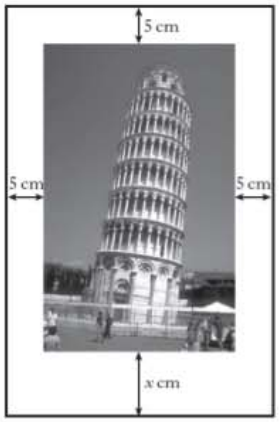
Calculate the x-coordinates of A and B. **4**

13. Asim has a poster which is 25 centimetres wide and 40 centimetres high.



He decides to place it on a white card.

The card and the poster are mathematically similar.

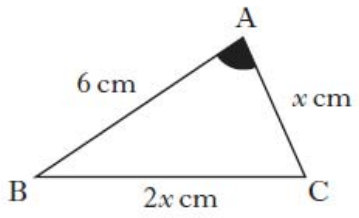


The border is 5 centimetres wide on three sides and *x* centimetres wide on the fourth side as shown.

Calculate the value of *x*. **4**

14. In triangle ABC:

- cos A = 0·5
- AB = 6 centimetres
- BC = $2x$ centimetres
- AC = x centimetres.

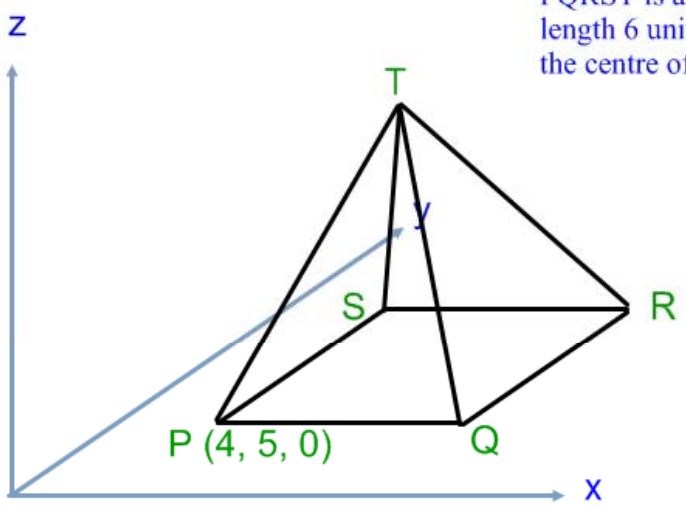


Show that $x^2 + 2x - 12 = 0$. 3

Additional Questions

15.

PQRST is a square based pyramid with base length 6 units. The vertex T is directly above the centre of the base.

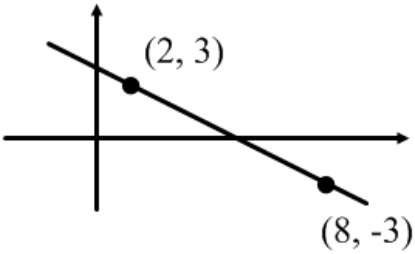


a) State the coordinates of R. 1

b) Find the coordinates of T if the pyramid has a height of 10 units. 1

c) Find the vector $\overrightarrow{RT}$ and hence find the length of $|\overrightarrow{RT}|$. 3

16. a) Find the equation of the straight line shown in the diagram below:



3

b) Find the point where this line crosses the x-axis. 2