Nat 5 Revision G - Paper 2 (Based on Credit 2011)

1. Olga normally runs a total distance of 28 miles per week.

   She decides to increase her distance by 10% a week for the next four weeks.

   How many miles will she run in the fourth week?

   3

2. Expand and simplify
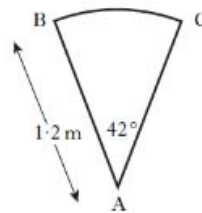
   $$(3x + 1)(x^2 - 5x + 4).$$

   3

3. Solve the equation

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

   4

   Give your answers **correct to 2 significant figures**.

4. A car is valued at £3780.

   This is 16% less than last year's value.

   What was the value of the car last year?

   3

5. A spiral staircase is being designed.

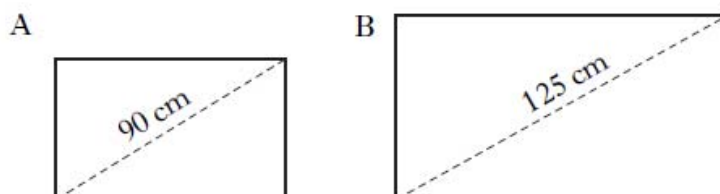   Each step is made from a sector of a circle as shown.

   The radius is 1·2 metres.

   Angle BAC is 42°.

   For the staircase to pass safety regulations, the arc BC must be at least 0·9 metres.

   Will the staircase pass safety regulations?

   4

6. Two rectangular solar panels, A and B, are mathematically similar.

   Panel A has a diagonal of 90 centimetres and an area of 4020 square centimetres.
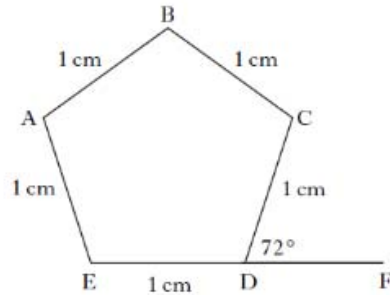
   A salesman claims that panel B, with a diagonal of 125 centimetres, will be double the area of panel A.
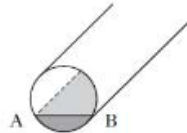
   Is this claim justified?

   Show all your working.

   4

7. ABCDE is a regular pentagon with each side 1 centimetre.

   Angle CDF is 72°.
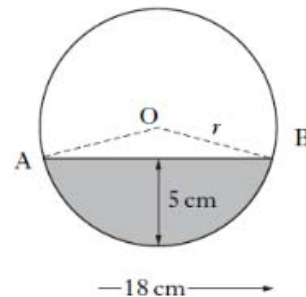
   EDF is a straight line.

   (a) Write down the size of angle ABC.　　　　　　　　　　**1**

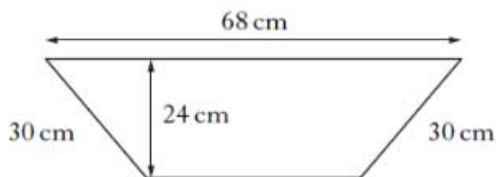   (b) Calculate the length of AC.　　　　　　　　　　**3**

8. A pipe has water in it as shown.

   The depth of the water is 5 centimetres.

   The width of the water surface, AB, is 18 centimetres.

   Calculate r, the radius of the pipe.　　　　　　　　　　**3**

9. A flower planter is in the shape of a prism.

   The cross-section is a trapezium with dimensions as shown.

   (a) Calculate the area of the cross-section of the planter.　　　　　　　　　　**2**

   (b) The volume of the planter is 156 litres.

   Calculate the length, l centimetres, of the planter.　　　　　　　　　　**3**
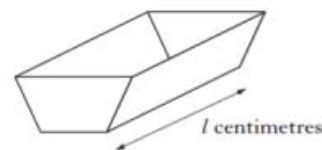
10. Tom and Samia are paid the same hourly rate.

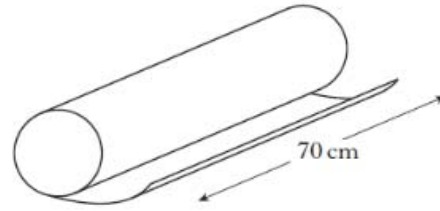   Harry is paid $\frac{1}{3}$ more per hour than Tom.

    Tom worked 15 hours, Samia worked 8 hours and Harry worked 12 hours.

    They were paid a total of £429.

    How much was Tom paid?　　　　　　　　　　**3**

11. Paper is wrapped round a cardboard cylinder **exactly** 3 times.

The cylinder is 70 centimetres long.
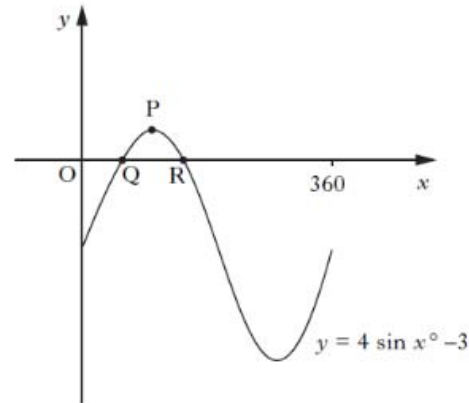
The area of the paper is 3000 square centimetres.

Calculate the diameter of the cylinder.

4

12. Part of the graph of $y = 4 \sin x° - 3$ is shown below.

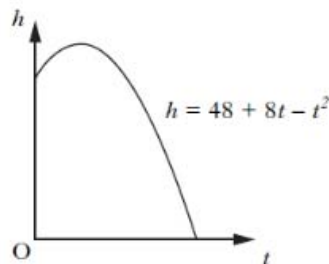The graph cuts the x-axis at Q and R.

P is the maximum turning point.

(a) Write down the coordinates of P.

1

(b) Calculate the x-coordinates of Q and R.

4

13. The diagram shows the path of a flare after it is fired.

The height, h metres above sea level, of the flare is given by

$h = 48 + 8t - t^2$ where t is the number of seconds after firing.

Calculate, **algebraically**, the time taken for the flare to enter the sea.

4

Additional questions

3

14. State the nature of the roots of the equation $5x^2 - 3x + 8 = 0$

15. Vectors **a** and **b** are described below.

Find $|3\underline{a} - 2\underline{b}|$.

$\underline{a} = \begin{bmatrix} 2 \\ -3 \\ 5 \end{bmatrix}$. $\underline{b} = \begin{bmatrix} -5 \\ -4 \\ 2 \end{bmatrix}$

3