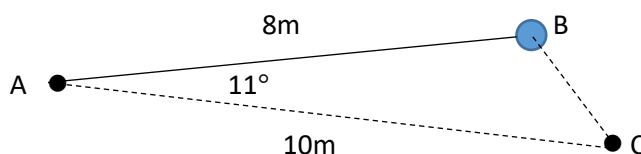


National 5 Homework

Mixed Homework

Exercise 9

- 1a. Write $x^2 - 6x - 2$ in the form $(x - a)^2 + b$ and state the coordinates of the turning point.
- 1b. Write down the equation of the axis of symmetry.
2. A golfer aims a shot from A at the hole (B) as shown in the diagram below. If the ball lands at C, calculate the distance from the ball to the hole after his shot.

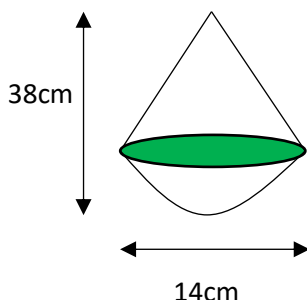


3. Expand the brackets and simplify
 $(x - 3)(2x + 1)(x + 6)$.
4. Write down the gradient and y-intercept of the straight line with equation $3x - 2y + 8 = 0$
5. Change the subject of the formula below to R.

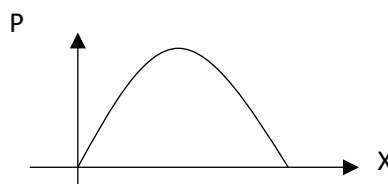
$$S = \frac{5R^2}{6}$$

6. After a 12% service charge is added to a restaurant bill, the final cost is £206.92. Work out the cost of the bill before the charge was added.
7. Simplify $(2x^2y^{1/2})^3$.
8. Factorise $3x^2 + 13x - 30$
9. A function has equation $h(x) = 6x + 7$. If $h(k) = 31$, find the value of k.
10. A child's toy is made of wood from joining a cone onto the top of a hemisphere. The height of the toy is 38cm and the diameter of the hemisphere is 14cm.

Calculate the volume of wood needed to make one of these toys. Round your answer to 3 significant figures.



11. A company's profit £P million after x years is modelled using the function $P(x) = 12x - x^2$, as shown below.
 - a. Calculate the profit after 5 years
 - b. Calculate the maximum profit the company made.



- 12.. State the nature and number of roots for the quadratic equation $y = 4x^2 + 12x + 9 = 0$