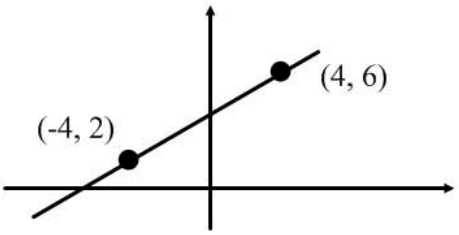
National 5 Revision D Paper 1 Based on Int 2 2010

1. Find the equation of the straight line shown:



3

2. The pupils in a primary class record their shoe sizes as shown below.

8	7	6	5	6
5	7	11	7	7
7	8	7	9	6
8	6	5	9	7

(*a*) Construct a frequency table from the above data and add a cumulative frequency column. 2

(*b*) For this data, find:

(i) the median; 1

(ii) the lower quartile; 1

(iii) the upper quartile. 1

(*c*) Construct a boxplot for this data. 2

3. The diagram below represents a sphere.

The sphere has a diameter of 6 centimetres.

Calculate its volume.

Take $\pi = 3{\cdot}14$. 2

4.

(*a*) Factorise

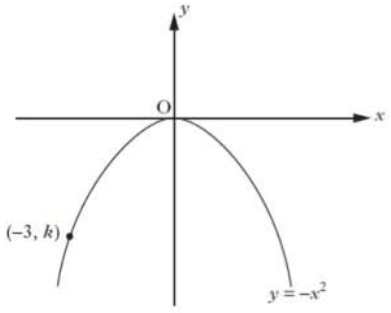
$$x^2 + x - 6.$$ 2

(*b*) Multiply out the brackets and collect like terms.

$$(3x + 2)(x^2 + 5x - 1)$$ 3

5. 1

The diagram below shows the graph of $y = -x^2$.



The point $(-3, k)$ lies on the graph.

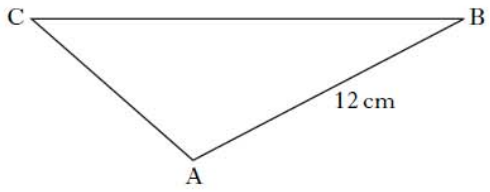
Find the value of k.

6.

Express

$$p^3(p^2 - p^{-3})$$ in its simplest form. 2

7.



In triangle ABC, AB = 12 centimetres, $\sin C = \frac{1}{2}$ and $\sin B = \frac{1}{3}$.

Find the length of side AC. **3**

8. Maria has been asked to find the roots of the equation

$$x^2 + 3x + 5 = 0.$$

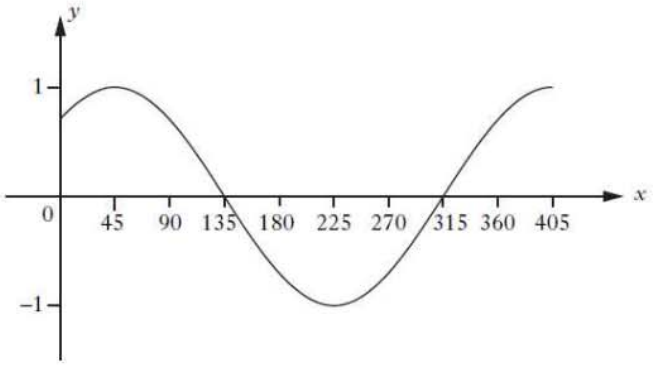
She decides to use the quadratic formula

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}.$$

(*a*) Calculate the value of $b^2 - 4ac$. **1**

(*b*) Now explain why Maria cannot find the roots. **1**

9. The graph shown below has an equation of the form $y = \cos(x - a)°$.



Write down the value of *a*. **1**

10.

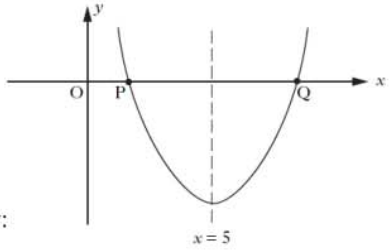
The graph below shows part of a parabola with equation of the form $y = (x + a)^2 + b$.

The equation of the axis of symmetry of the parabola is $x = 5$.

(*a*) State the value of *a*. **1**

(*b*) P is the point (2, 0). State the coordinates of Q. **1**

(*c*) Calculate the value of *b*. **2**



11. State the nature of the roots of the equation below: **3**

$3x^2 - 4x - 2 = 0$