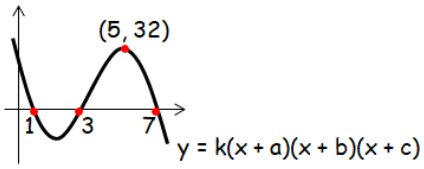
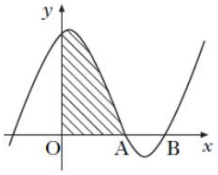
Name:	Date:
Question 1: Find the range of values of k such that the equation $x^2 - 2x - k = 0$ has real roots.	8·4 Silver Outcome 2
Question 2: Find the centre and radius of the circle with equation $x^2 + y^2 + 8x - 12y - 29 = 0$	11·1 Silver Outcome 2
Question 3: Find the equation of the straight line which is parallel to the line which makes an angle of 45° with the positive direction of the x-axis and which passes through the point $(4, 9)$.	1·6 Gold Outcome 3
Question 2: The equation of the cubic shown is of the form y = k(x + a)(x + b)(x + c).  What is the equation of this cubic?	8·1 Gold Outcome 3
Question 5: For what values of x is the function $y = x^3 + 12x^2$ decreasing?	6·4 Bronze Outcome 1
My score:	

Exam Questions

Question 1:

The diagram shows a sketch of the graph of $y = x^3 - 4x^2 + x + 6$.



(a) Show that the graph cuts the x-axis at $(3, 0)$. **1**

(b) Hence or otherwise find the coordinates of A. **3**

(c) Find the shaded area. **5**

Question 2:

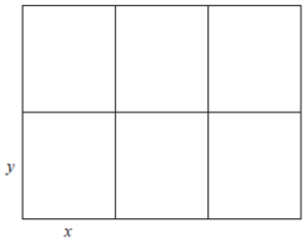
A curve has equation $y = x - \frac{16}{\sqrt{x}}, \quad x > 0.$

Find the equation of the tangent at the point where $x = 4$. **6**

Question 3:

A council is setting aside an area of land to create six fenced plots where local residents can grow their own food.

Each plot will be a rectangle measuring x metres by y metres as shown in the diagram.



(a) The area of land being set aside is 108 m^2.
Show that the total length of fencing, L metres, is given by **3**

$$L(x) = 9x + \frac{144}{x}.$$

(b) Find the value of x that minimises the length of fencing required. **6**

My score: