# DIFFERENTIATION & FUNCTIONS (Q 6, 7 & 8, PAPER 1)

## LESSON NO. 12: QUADRATIC GRAPHS

## 2006

- 6 (c) Let  $f(x) = 3 + 8x 2x^2$ ,  $x \in \mathbf{R}$ .
  - (i) Find the co-ordinates of the point at which the curve y = f(x) cuts the y-axis.
  - (ii) Find the value of x for which f(x) is a maximum.
  - (iii) For what range of values of x is f'(x) > 4?

### 2003

- 6 (c) Let  $f(x) = 3 5x 2x^2$ ,  $x \in \mathbf{R}$ .
  - (i) Find f'(x), the derivative of f(x), and hence find the co-ordinates of the local maximum point of the curve y = f(x).
  - (ii) Solve the equation f(x) = 0.
  - (iii) Use your answers from parts (i) and (ii) to sketch the graph of
    - $f: x \rightarrow 3-5x-2x^2$ , showing scaled and labelled axes.

### 1996

6 (b) Let  $g(x) = x^2 + bx + c, x \in \mathbf{R}$ .

The solutions of g(x) = 0 are symmetrical about the line x = 1. If x = -3 is one solution of g(x) = 0, find the other solution. Find the value of *b* and the value of *c*.

 Answers

 **2006** 6 (c) (0, 3)
 (ii) x = 2 (iii) x < 1 

 **2003** 6 (c) (i)  $f'(x) = -5 - 4x; (-\frac{5}{4}, \frac{49}{8})$  (ii)  $-3, \frac{1}{2}$ 
**1996** 6 (b) x = 5; b = -2, c = -15