## Differentiation \& Functions (Q 6, 7 \& 8, Paper 1)

## Lesson No. 12: Quadratic Graphs

## 2006

6 (c) Let $f(x)=3+8 x-2 x^{2}, x \in \mathbf{R}$.
(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 $f^{\prime}(x)>4$ ?

## 2003

6 (c) Let $f(x)=3-5 x-2 x^{2}, x \in \mathbf{R}$.
(i) Find $f^{\prime}(x)$, 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 $f: x \rightarrow 3-5 x-2 x^{2}$, showing scaled and labelled axes.

## 1996

6 (b) Let $g(x)=x^{2}+b x+c, x \in \mathbf{R}$.
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
20066
(c) $(0,3)$
(ii) $x=2$
(iii) $x<1$
20036
(c) (i) $f^{\prime}(x)=-5-4 x ;\left(-\frac{5}{4}, \frac{49}{8}\right)$
(ii) $-3, \frac{1}{2}$
19966 (b) $x=5$; $b=-2, c=-15$

