

3. (a) Differentiate with respect to x each of these:

(i) $3x + 2$

(ii) $\frac{1}{2}x^2 - 3x - 5$

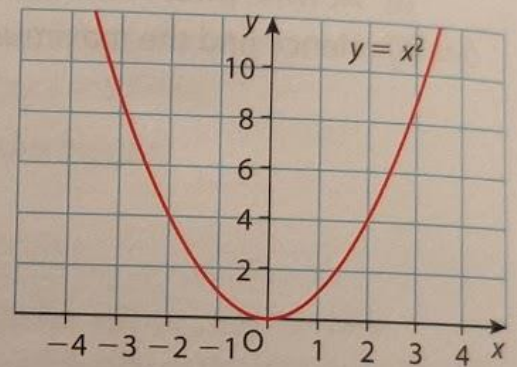
(iii) $2x^3 - x^2 - 9x$

(b) The graph of the curve $y = x^2$ is shown on the right.

(i) Find the slope of the tangent to this curve at the point where $x = 2$.

(ii) At what point on the curve is the slope of the tangent -2 ?

(iii) Find the coordinates of the point on the curve at which the slope is zero.



(c) A rectangular patch of ground is to be enclosed with 100 metres of fencing wire.

(i) If the length of the patch is x metres, express the width in terms of x .

(ii) Express the area, $A \text{ m}^2$, in terms of x .

(iii) Find the value of x for which A is a maximum.

(iv) Find this maximum area.

