Second Order Derivatives

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ when:

(a) $y = x^2 + 4x - 3$

(b) $y = 5x^3 + x^2 + 8x - 3$

(c) $y = x^4 - 7x^2$

(d) $y = x^2 - \frac{2}{x}$

Find the coordinates of the stationary points on each of these curves. By differentiating for a second time, establish whether these points are maximums or minimums.

(a) $y = 4x^2 - 8x$

(b) $y = 5 + 2x - x^2$

(c) $y = (8 + x)(2 - x)$

(d) $y = x^4 - 8x^2$

(e) $y = 2x^3 - 3x^2 - 12x + 5$

(f) $y = x + \frac{1}{x}$

(a) Find the coordinates of the stationary point on the curve
$y = x^3 + 3x^2 + 3x + 1$.

(b) By considering the gradient either side of the stationary point, show that the stationary point is a point of inflection.

(a) Find the coordinates of the stationary point on the curve $y = (2 - x)^3$.

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