**Second Order Derivatives**

Find $\frac{dy}{dx}$ and $\frac{d^{2}y}{dx^{2}}$ 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 $y=(2-x)^{3}$.

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

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