Leith Academy Higher Home Learning

DIFFERENTIATION **NON-CALCULATOR**

1) Differentiate the following functions with respect to x.

a) $y = 2x^3 - 4x^2 + 5x - 2$

b) $y = 4x^{-3} - 6x^{-2} + 3x^{-1}$

c) $y = 8x^{1/4} + 6x^{2/3} - 4x^{-1/2}$

d) $f(x) = \frac{4}{x} + \frac{3}{x^2}$

e) $f(x) = 4\sqrt{x} - 9\sqrt[3]{x}$

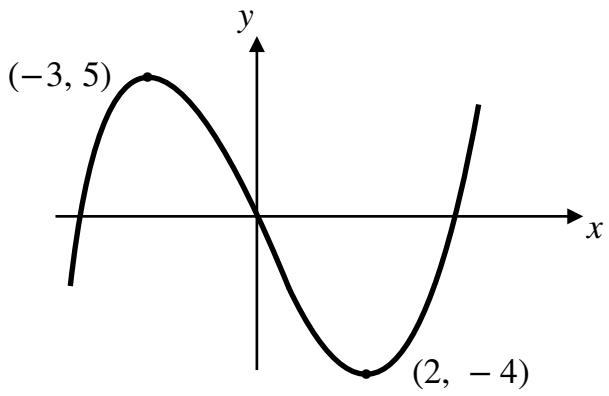
f) $f(x) = \frac{6x^2 + 2x^3}{4x}$

2) Calculate the equation of the tangent to the curve with equation $y = 2x^3 - 5x^2 + 4x$ at the point where $x = 2$.

3) A curve has the equation $y = \frac{2}{3}x^3 - 4x^2 - 24x$. Work out the coordinates of the stationary points and determine their nature.

4) Work out both the maximum and minimum values of the function $f(x) = x^3 - \frac{21}{2}x^2 - 54x$ between the interval $-10 \leq x \leq 10$

5) Shown below is the graph of the function $y = f(x)$. It has turning points at $(-3, 5)$ and $(2, -4)$.



Sketch the graph of $y = f'(x)$.