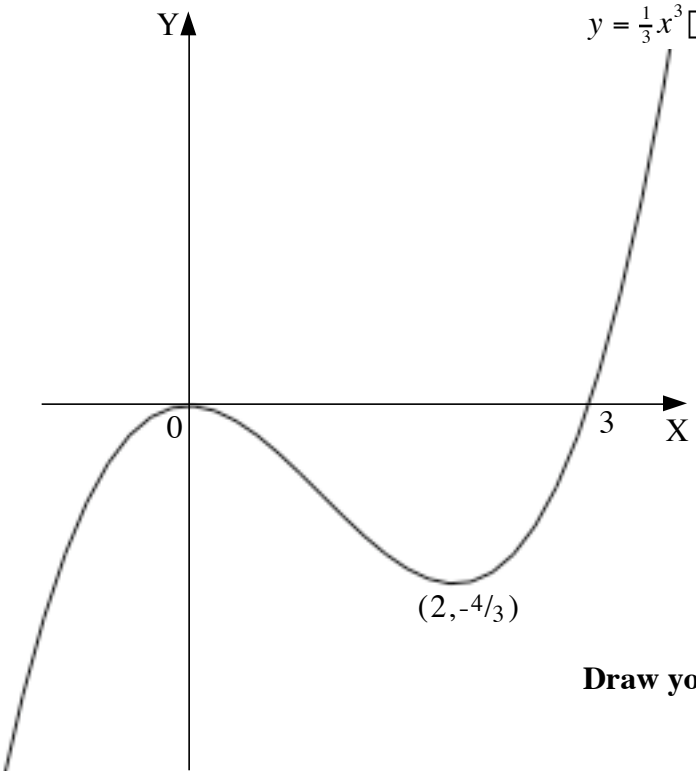
HOME EXERCISE 5

Set out carefully all appropriate working. Do not use a calculator.

1.



The graph with equation $y = \frac{1}{3}x^3 - x^2$ is shown.

The graph meets the axes at $(0,0)$ and $(3,0)$ and has stationary points $(0,0)$ and $(2,-4/3)$.

Use this graph to sketch the graph:

(a) with equation $y = x^2 - \frac{1}{3}x^3$ (2)

(b) with equation $y = x^3 - 3x^2$ (2)

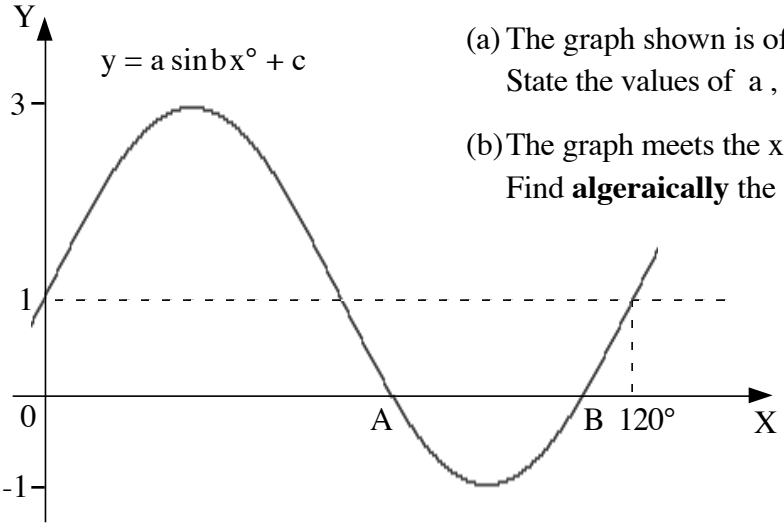
(c) of the derived function. (2)

Draw your sketches on three separate diagrams.

2. Find $\frac{d}{dt}\left(\sqrt{t^3} - \frac{1}{\sqrt{t}}\right)$, writing your answer in root form. (4)

3. The line passing through the point $(2,-3)$ makes an angle of 135° with the positive direction of the x-axis. Find the equation of the line, writing your answer in the form $Ax + By + C = 0$. (3)

4.



(a) The graph shown is of the form $y = a\sin bx° + c$.
State the values of a , b and c. (3)

(b) The graph meets the x-axis at the points A and B.
Find **algeraically** the x-coordinates of points A and B. (4)

Total 20 marks