Curve Sketching Higher

1. A graph has the equation $f(x) = x^3 - 3x - 2$

a. Show that $x = -1$ is a solution of $f(x) = 0$

b. Find all other solutions of $f(x) = 0$

c. Find the coordinates and determine the nature of the turning point of $y = f(x)$.

d. Sketch the curve $y = f(x)$

2. A graph has the equation $y = x^4 + 8x^3 + 18x^2 - 27$

a. Show that $x = 1$ is a solution of $f(x) = 0$

b. Find all other solutions of $f(x) = 0$

c. Find the coordinates and determine the nature of the turning point of $y = f(x)$.

d. Sketch the curve $y = f(x)$

3. A graph has the equation $y = x^3 - 12x - 16$

a. Show that $x = 4$ is a solution of $f(x) = 0$

b. Find all other solutions of $f(x) = 0$

c. Find the coordinates and determine the nature of the turning point of $y = f(x)$.

d. Sketch the curve $y = f(x)$

4. A graph has the equation $y = x^3 - 2x^2 - 20x - 24$

a. Show that $(x + 2)$ is a factor of $f(x)$

b. Hence, solve $f(x) = 0$

5. A graph has the equation $y = 3x^4 + 10x^3 + x^2 - 8x - 6$

a. Show that $(x + 2)$ is a factor of $f(x)$

b. Hence, fully factorise $f(x)$

6. A graph has the equation $y = 2x^3 - 5x^2 + x + 2$

a. Show that $(x - 1)$ is a factor of $f(x)$

b. Hence, find the roots of $y = f(x)$

7. For the function $f(x) = x^3 - 4x^2 + ax + b$.

- $(x - 1)$ is a factor of $f(x)$
- -12 is the remainder when $f(x)$ is divide by 2

a. Find the values of a and b

b. Hence, find the roots of $y = f(x)$