Sketch the graph of

$y = 2x^3 + 7x^2 + 2x - 3$

-3: $\pm 1, \pm 3$

2: $\pm 1, \pm 2$

Testing values: $\pm 1, \pm \frac{1}{2}, \pm 3, \pm \frac{3}{2}$

$f(-1) = 0 \rightarrow (x+1)$ is a factor

$f(\frac{1}{2}) = 0 \rightarrow (2x-1)$ is a factor

$f(-3) = 0 \rightarrow (x+3)$ is a factor

$\therefore f(x) = (2x-1)(x+1)(x+3)$

The leading coefficient: $(2)(1)(1) = 2$

The constant term: $(-1)(1)(+3) = -3$

(Full) factored form:

$y = 2(x - \frac{1}{2})(x+1)(x+3)$

degree $= 3 \leftarrow$ odd, lead coeff $= 2 > 0$

QIII to QI