

$$\textcircled{1} \quad y' = (8x^3 + x^2 + 1)(12x^2 - 6x) + (4x^3 - 3x^2 + 2)(24x^2 + 2x)$$

$$\begin{aligned} y'|_{x=-1} &= (-6)(18) + (-5)(22) \\ &= -218 \end{aligned}$$

$$m_{\text{tan}} = -218$$

$$m_{\text{normal}} = \frac{-1}{m_{\text{tan}}} = \frac{1}{218}$$

We also need $y|_{x=-1} = (8x^3 + x^2 + 1)(4x^3 - 3x^2 + 2)|_{x=-1}$

$$\begin{aligned} &= -6(-5) \\ &= 30 \end{aligned}$$

$$\left. \begin{aligned} m &= \frac{1}{218} \\ (x_1, y_1) &= (-1, 30) \end{aligned} \right\} \rightarrow \begin{aligned} y - y_1 &= m(x - x_1) \\ y - 30 &= \frac{1}{218}(x + 1) \end{aligned}$$

$$218y - 6540 = x + 1$$

$$\begin{aligned} 218y - x - 6541 &= 0 \\ \text{or } x - 218y + 6541 &= 0 \end{aligned}$$

②

$$f(x) = x^5 + 7x - 40$$

$$f'(x) = 5x^4 + 7$$

x_n	$f(x_n)$	$f'(x_n)$	$x_n - \frac{f(x_n)}{f'(x_n)}$
2	6	87	1.93

$$x_1 \approx 1.93$$