1. Find $\frac{dy}{dx}$ at the point (1,-1) for $xy + y^3 = 2x^2y$.

2. Use logarithmic differentiation to find $f'(x)$.

$$f(x) = \frac{(\sin x)^5(2x - 4)^3e^{7x}}{(3x^3 - 4x + 5)^4}$$

3. Determine the following limits.

(a) \[ \lim_{x \to \infty} \frac{2x^2 + 3x + 1}{4x^3 + 2x} \]

(b) \[ \lim_{x \to \infty} \frac{\ln(2x + 1)}{x^2} \]