1. Compute the following limits:

(a) \( \lim_{x \to 2} \frac{x - 2}{x^2 - 5x + 6} \)

(b) \( \lim_{h \to 0} \frac{x^2 - (x - 2h)^2}{h} \)

(c) \( \lim_{x \to 1} \frac{\sqrt{x} - 1}{x - 1} \)

(d) \( \lim_{x \to -\infty} \frac{3x^3 - 4}{2x^3 - 2} \)

2. Let \( f(x) = -x^2 + 3 \).

(a) Using the definition of the derivative as a limit, compute \( f'(x) \).

(b) Find the equation for the tangent line at \( x = 2 \).

(c) Graph \( f(x) \) and the tangent line.

3. Compute the following derivatives:

(a) \( f(x) = 2 + x + \frac{3}{x} - \sqrt{x} - 5x^7 + x^{3/4} \)

\[ f'(x) = \]

(b) \( y = \frac{x^3 + x}{x} \) \( \Rightarrow \frac{dy}{dx} = \)

(c) \( D_x \left[ (x^9 + x^8 + x^5 + 3)(1 + 2x^2 + 9x^3 - 4x^4) \right] = \)

(d) \( \frac{d}{dx} \left[ (x^9 + 2x^{1/3} + x^5 + 3)^4 \right] = \)

4. Compute the following derivatives:

(a) If \( f(x) = \frac{u(x)v(x)}{w(x)} \), then in terms of \( u(x), v(x), w(x), u'(x), v'(x), \) and \( w'(x) \), we have \( f'(x) = \)

(b) \( y = (3 + x^4)^8 x^3 \) \( \Rightarrow \frac{dy}{dx} = \)

(c) \( D_x \left[ ((x^9 + x^8 + x^5 + 3)(1 + 2x^2 + x^3 - 4x^4))^{9} \right] = \)