

Show all work

1. (6 points) Evaluate the following limits without using a calculator:

(a) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$

(b) $\lim_{x \rightarrow \infty} \frac{x^2 - 2x + 4}{2 - 3x + 4x^2}$

2. (7 points) By evaluating an appropriate limit find the slope of the tangent line to the curve $y = f(x) = x^2 - 5x$ corresponding to $x = 1$. Find an equation of this tangent line.

3. (7 points) Use the definition of the derivative to find the derivative function of $f(x) = \sqrt{2x + 3}$.