1. (15 points) Find a unit vector in the same direction as \( \langle 3, -5 \rangle \).

2. (20 points) Determine the horizontal and vertical asymptotes to the graph of the function
   \[ y = \frac{x^2 + 4}{x^2 - 1}. \]

3. (8 points each) Evaluate the limits.
   (a) \[ \lim_{x \to -3} \frac{x^2 - x - 12}{x + 3} \]
   (b) \[ \lim_{x \to 1} (x^2 + 1)(x^2 + 4x) \]
   (c) \[ \lim_{x \to 5} \frac{6}{x - 5} \]

4. (20 points) For what value of the constant \( c \) does the function
   \[ f(x) = \begin{cases} 
   cx + 1 & \text{if } x \leq 3 \\
   cx^2 - 1 & \text{if } x > 3 
   \end{cases} \]
   have a limit \( \lim_{x \to 3} f(x) \)?

5. (21 points) Find the equation of the tangent line to the curve \( y = 1 - 3x^2 \) at the point \((-2, -11)\).