Math 101-151-Class Test 1

Name: ID Serial:

Show all your work. No credits for answers not supported by work

Q4: find the limit if it exists

1. $\lim_{x\to 1} \frac{\sqrt{x^2+1}-\sqrt{2}}{x-1} =$

2. $\lim_{x\to -1} \frac{x+1}{(2x^2+7x+5)^2} =$

3. $\lim_{x\to -\infty} \frac{5x^5+1}{|x|^5-4} =$

Q2: Prove that $\lim_{x\to -1}(2-3x) = 5$ using the $\varepsilon - \delta$ definition

Q3: Let $f(x) = x^2 - 4x$ be a function defined over the interval $[-1, 2]$, **use the limit** to find the equation of the tangent line at $P(1, -3)$.

Q4: Find the horizontal and the vertical asymptotes of $f(x) = \frac{1+4e^x}{1-2e^x}$