

Quiz One

Math 101 - 142

Name: _____

ID: _____

Section: _____

1. Calculate the following limits

(a) $\lim_{x \rightarrow 16} \frac{x - 16}{4 - \sqrt{x}}$

(b) $\lim_{x \rightarrow \infty} \frac{x^2 + 2x + 3}{2x^2 + 7x - 1}$

(c) $\lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2 - 1}}$

(d) $\lim_{x \rightarrow 0} \frac{\tan 3x}{5x \sec 2x}$

2. Use the definition of derivative to calculate the equation of the tangent to $f(x) = \frac{1}{x-2}$ at the point $x = 4$.

3. Sketch the graph of a function $f(x)$ that has the following properties:

(a) $\lim_{x \rightarrow -\infty} f(x) = 2$

(b) $f(-3) = 0$

(c) f has a jump discontinuity at $x = 0$

(d) $\lim_{x \rightarrow 1^-} f(x) = -\infty$

(e) $\lim_{x \rightarrow 1^+} f(x) = 2$

(f) $f(x)$ has a removable discontinuity at 2

(g) $\lim_{x \rightarrow \infty} f(x) = 0$