

Math 2143 - Brief Calculus with Applications

Quiz #14 - 2008.04.01

Name: _____

1. Compute the following limit.

$$\lim_{x \rightarrow 1} \frac{\sqrt{x^2 + 4x - 1} - 5}{x + 1}$$

2. Compute the following derivative.

$$\frac{d}{dx} \frac{4x^2 + 3x - 1}{7x^3 + 2x - 1}$$

3. Fill in the blanks for the following statements.

a) If $f(x)$ is increasing and concave down at $x = a$, then $f'(a)$ ___ 0 and $f''(a)$ ___ 0.

b) If $f(x)$ is decreasing and concave up at $x = b$, then $f'(b)$ ___ 0 and $f''(b)$ ___ 0.

c) If $f'(c) = 0$ and $f''(c) > 0$, then $f(x)$ has a local _____ at $x = c$.

d) If $f'(d) = 0$ and $f''(d) < 0$, then $f(x)$ has a local _____ at $x = d$.