

Math 2215 - Calculus 1

Exam #1 - 2016.08.29

Name: _____

1. Compute the following limit:

$$\lim_{x \rightarrow -\infty} \frac{x^3 - 3x^2 + 2}{\sqrt{4x^6 - 2x^3 + 5x}}$$

2. Compute the following limit:

$$\lim_{x \rightarrow 3^-} \frac{(x+4)^2(x+1)(x+3)}{(x-1)(x+1)(x-3)^2(x-2)}$$

3. Compute the following limit:

$$\lim_{x \rightarrow 0} \frac{\sin(3x^2)}{5x^2}$$

4. Compute the following limit:

$$\lim_{h \rightarrow 0} \frac{(3+h)^3 - 27}{h}$$

5. State the algebraic definition of a function $f(x)$ being continuous at the point $x = a$.

6. Find the value of a for which the following function is continuous everywhere.

$$f(x) = \begin{cases} 3x^2 - 2x + 1, & x \leq 0 \\ 3 - a \cos(2x), & x > 0 \end{cases}$$

7. Compute the following limit:

$$\lim_{z \rightarrow \infty} \tan\left(\frac{\pi z^2 - 3z + 2}{4z^2 + 2z - 1}\right)$$

8. Compute the following limit:

$$\lim_{x \rightarrow 0^+} \frac{|5x| + 2x}{|2x| - 5x}$$