Solutions

Math 19: Quiz 8   Name:

For full credit you must show your work. Partial credit may be given for incorrect solutions if sufficient work is shown.

Apply L'Hopital's Rule where possible to evaluate the following limits.

1. (4 pts)

$$\lim_{x \to -9} \frac{x+9}{x^2 + 12x + 27} = \frac{-9+9}{(-9)^2 + 12(-9) + 27} = \frac{0}{0} \quad \text{LH Rule applies}$$

$$= \lim_{x \to -9} \frac{1}{2x+12}$$

$$= \frac{1}{2(-9)+12} = \frac{1}{-18+12} = \boxed{-\frac{1}{6}}$$

2. (3 pts)

$$\lim_{x \to \infty} \frac{e^{3x}}{x^2} = \frac{\infty}{\infty} \quad \text{LH Rule applies}$$

$$= \lim_{x \to \infty} \frac{3e^{3x}}{2x} = \frac{\infty}{\infty} \quad \text{LH Rule applies}$$

$$= \lim_{x \to \infty} \frac{9e^{3x}}{2} = \frac{\infty}{2} = \boxed{+\infty}$$

3. (3 pts)

$$\lim_{x \to 5} \frac{x-5}{(x+5)^4} = \frac{5-5}{(5+5)^4} = \frac{0}{10^4} = 0$$

LH Rule does not apply.
(not $\frac{0}{0}$ or $\frac{\pm\infty}{\pm\infty}$)