

KEY

Math 125-Quiz 8¹ September 21, 2011

You have ten minutes to complete this quiz.

Use algebra and the limit laws to calculate each of the following limits, or explain why they don't exist.

1.

$$\lim_{x \rightarrow 2} x^2 - 3x + 1$$

no discontinuities \rightarrow limit laws

$$\lim_{x \rightarrow 2} x^2 - \lim_{x \rightarrow 2} 3x + \lim_{x \rightarrow 2} 1 = 4 - 6 + 1 = -1$$

2.

$$\lim_{x \rightarrow 0} \frac{x^2 - 3x}{x^2 + 5x} = \lim_{x \rightarrow 0} \frac{\cancel{x}(x-3)}{\cancel{x}(x+5)} = \lim_{x \rightarrow 0} \frac{x-3}{x+5} = \frac{-3}{5}$$

3.

$$\lim_{x \rightarrow 0} \frac{x^2 - 3x}{x^2 - 5} \rightarrow \frac{0}{-5} = 0$$

4.

$$\lim_{x \rightarrow 0} \frac{x^2 - 3}{x^2 - 5x} = \frac{3}{0} \text{ DNE}$$

5.

$$\lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 4} - 2}{x^2} \cdot \frac{\sqrt{x^2 + 4} + 2}{\sqrt{x^2 + 4} + 2} = \lim_{x \rightarrow 0} \frac{x^2 + 4 - 4}{x^2(\sqrt{x^2 + 4} + 2)} = \lim_{x \rightarrow 0} \frac{1}{\sqrt{x^2 + 4} + 2} \Rightarrow \frac{1}{4}$$

¹You are excused to leave when you're finished with this quiz.