MATH 133 – Calculus with Fundamentals 1
More on Indeterminate Forms and Algebraic Evaluation of Limits
October 5, 2017

Background

Today we will work on more examples of algebraic methods to compute indeterminate form limits. *You will need to recognize which algebraic methods apply and work through examples like these without the prompts from me for this week's problem set and quiz.*

Questions

Compute the following limits:

(1)
$$\lim_{x \to 3} \frac{x^2 - 6x + 9}{x^2 - 5x + 6},$$

(2) (Hint: The top is a difference of squares – factor and try to cancel)
$$\lim_{t \to 0} \frac{3^{2t} - 1}{3^t - 1}$$

(3)
$$\lim_{x \to 3} \frac{x - 3}{\sqrt{x} - \sqrt{6 - x}}.$$

(4) (Hint: Factor the $x^3 + 8 = (x + 2)(x^2 + Ax + B)$ for some A, B)
$$\lim_{x \to -2} \frac{x^2 + 3x + 2}{x^3 + 8}$$

(5)
$$\lim_{x \to 2} \frac{\frac{1}{x} - \frac{1}{2}}{x - 2}$$

(6) The following one is called an $\infty - \infty$ form. Start by putting the terms over a common denominator. What kind of indeterminate form do you have now? Then try to apply one of the ideas we have discussed.
$$\lim_{x \to -1} \left(\frac{1}{x + 1} - \frac{2}{x^2 + 4x + 3} \right).$$