

**Quiz 3**  
**Sections 2.5-2.6**

Calculus 1  
due February 3, 2015

This quiz is due on Tuesday, February 3, 2015 at the beginning of your drill. You may use your brain, notes, book, other humans and any pet of your choice. **Your solutions must be on a separate sheet of paper, in order, stapled, de-fringed, and legible with your name on the top right corner of the first page.** If you fail to meet any of these requirements you will receive a zero. Each question is worth one point and is all or nothing.

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Evaluate the following limits analytically

1.  $\lim_{x \rightarrow \infty} \frac{4x^5 - 2x^3}{3x^5 - 2}$

2.  $\lim_{y \rightarrow -\infty} \frac{y^2 - 2y + 3}{y}$

3.  $\lim_{\theta \rightarrow \infty} \frac{\cos \theta + \sin \theta}{\theta^2}$

4.  $\lim_{z \rightarrow \infty} 1 - \ln(z)$

5. Find all the asymptotes of the function

$$f(x) = \frac{x + 1 - \sqrt{x^2 - 2x + 3}}{2x - 5}.$$

6. Is the function  $f(x) = x^2 - 3$  continuous at  $x = 2$ ? Justify your answer.

7. Is the function  $f(x) = \ln(2 - x)$  continuous at  $x = 3$ ? Justify your answer.

8. Find the intervals of continuity of the function

$$f(x) = \frac{t^3 + 2t^2 - 1}{t^2 - 3}.$$

9. Find  $a$  and  $b$  such that the function below is continuous for all real  $x$

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

10. Find  $a$  such that the function below is continuous for all real  $x$

$$f(x) = \begin{cases} \frac{x^2 - 4}{x - 2}, & x \neq 2 \\ a, & x = 2. \end{cases}$$