## **Review Problems**

## September 16, 2016

- 1. (Fall 2009, Exam 1, #11) Let  $a = \lim_{x \to \infty} (x^2 x)$  and  $b = \lim_{x \to 0} (x^2 x \sin \frac{1}{x})$ . Evaluate a and b.
- 2. (Fall 2009, Exam 1, #12) Find the total number of asymptotes, vertical and horizontal, for the graph of  $f(x) = \frac{\sqrt{9x^2 + 1}}{x}$ .
- 3. (Fall 2009, Exam 1, #14) The quantity  $\lim_{x \to \frac{\pi}{3}} \frac{\cos X \frac{1}{2}}{x \frac{\pi}{3}}$  represents the derivative of some function f(x) at some number a. Find an appropriate f(x) and a.
- 4. Find the equation of the tangent line T to the graph of f(x) at x = 1.



- 5. (Fall 2010, Exam 1, #13) Evaluate  $\lim_{x \to 1} \frac{\sqrt{3x+1}-2}{x-1}$ .
- 6. (Fall 2010, Exam 1, #14) If  $f(x) = \begin{cases} 3x + a & x \le 1\\ \sqrt{2x 1} & x > 1 \end{cases}$  and if f is continuous at x = 1, what is a?
- 7. (Fall 2010, Exam 1, #15) If  $A = \lim_{x \to \infty} \frac{-x}{\sqrt{x^2 + 4}} + 1$  and  $B = \lim_{x \to -\infty} \frac{-x}{\sqrt{x^2 + 4}} + 1$ , then find A and B.
  - $\sum_{x \to -\infty} \frac{1}{\sqrt{x^2 + 4}} + 1, \text{ of our line in a fit and } D$
- 8. (Fall 2010, Exam 1, #16) Evaluate  $\lim_{x \to 2} \frac{1 + \sqrt{x+2}}{1 \sqrt{2x}}$ .