Math 180 Name _____
Fall, 2008

Homework #3
Due Monday, September 15
No late papers accepted! No excuses!

1. Find a value for $\delta > 0$ such that for all x satisfying $0 < |x - x_0| < \delta$ the inequality $|f(x) - L| < \varepsilon$.

$$f(x) = \sqrt{1 - 5x}$$
$$x_0 = -3$$
$$\varepsilon = 0.5$$

2. Find the following limits.
   a) $\lim_{x \to 0} \dfrac{x + x\cos x}{\sin x \cos x}$

b) $\lim_{x \to -\infty} \frac{\cos x}{3x}$

c) $\lim_{x \to -\infty} e^x \arccos\left(\frac{1}{x}\right)$

d) $\lim_{x \to -\infty} \frac{x}{\sqrt{4x^2+1}}$

e) $\lim_{x \to 0^+} \lfloor x \rfloor$

3. Find the vertical and horizontal asymptotes, if any, of the function. Use calculus.

$$f(x) = \frac{-4x}{x^2 + 4}$$