

Problem Set #4

Due: Thursday, 6 October 2011

1. Compute the following limits.

(a) $\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{1 - x}$

(b) $\lim_{x \rightarrow y} \frac{x^3 - y^3}{x - y}$

2. Find the following limits, when they exist.

(a) $\lim_{x \rightarrow \infty} \frac{\sqrt{|x|}}{x}$

(b) $\lim_{x \rightarrow -\infty} \frac{x + \sin^3(x)}{x^2 + 5}$

(c) $\lim_{x \rightarrow \infty} \frac{x \sin(x)}{x + \sin(x)}$

3. Use the vertical asymptotes of the following functions to match them with the correct graph.

Assume that $a > 0$.

(a) $y = \frac{a}{x} - x$

(b) $y = \frac{(x - a)(x + a)}{x}$

(c) $y = \frac{(x - a)(x^2 + a)}{x^2}$

