

Math 10350 Fall 07 – Handout 8
(Sections 3.5)

1. Find the following limits:

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

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

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

d. $\lim_{x \rightarrow -\infty} \frac{x^{100} + 5x + 5}{5 - 100x^{99} - 3x^{100}}$

e. $\lim_{x \rightarrow \infty} \frac{\sin x}{x^2 + 5}$

f. $\lim_{x \rightarrow \infty} \frac{x^2 - 9}{\sqrt{2x^3 - 2x + 3}}$

2. A purchasing officer gathers from a manufacturer that an order of x units of product X gives him a deal of $\frac{60}{3x + 1}$ thousands of dollars per unit of X. Write down the total cost function $C(x)$ which gives the amount of money the officer has to pay. Describe the monotonicity of the cost function. Discuss the budget for the company in purchasing product X. Give a sketch of the graph of $C(x)$.

3. Find the following limits:

a. $\lim_{x \rightarrow \infty} \left(x - \sqrt{x^2 + x} \right)$

b. $\lim_{x \rightarrow -\infty} \left(x - \sqrt{x^2 + x} \right)$