Math 121 HW #3

Due: Feb. 16

Chapter 10.1

For these problems, find the indicated limits. It may be helpful to graph these at times.

9.
$$\lim_{x\to 2} 16$$

10.
$$\lim_{x\to 3} 2x$$

12.
$$\lim_{t\to 1/3} 5t-7$$

13.
$$\lim_{x\to -2} 3x^3-4x^2+2x-3$$

14.
$$\lim_{r\to 9} \frac{4r-3}{11}$$

18.
$$\lim_{z\to 0} \frac{z^2-5z-4}{z^2+1}$$

21.
$$\lim_{x\to -2} \frac{x^2+2x}{x+2}$$

22.
$$\lim_{x\to -1} \frac{x+1}{x+1}$$

23.
$$\lim_{x\to 2} \frac{x^2-x-2}{x-2}$$

25.
$$\lim_{x\to 3} \frac{x^2-x-6}{x-3}$$

28.
$$\lim_{x\to 0} \frac{x^2-2x}{x}$$

34.
$$\lim_{x\to 0} \frac{(x+2)^2-4}{x}$$

Chapter 10.2

For these problems, find the indicated limits, or say that one does not exist.

3.
$$\lim_{x\to 3^+} x-2$$

4.
$$\lim_{x\to -1^+} 1-x^2$$

5.
$$\lim_{x\to -\infty} 5x4$$

7.
$$\lim_{x\to 0^-} \frac{6x}{x^4}$$

8.
$$\lim_{x\to 2} \frac{7}{x-1}$$

12.
$$\lim_{h\to 5^-} \sqrt{5-h}$$

13.
$$\lim_{x\to -2} \frac{-3}{x+2}$$

16.
$$\lim_{x\to 2^+} x\sqrt{x^2-4}$$

19.
$$\lim_{x\to \infty} \frac{3}{\sqrt{x}}$$

21.
$$\lim_{x\to \infty} \frac{x+8}{x-3}$$

22.
$$\lim_{x\to \infty} \frac{2x-4}{3-2x}$$

24.
$$\lim_{r\to \infty} \frac{r^3}{r^1+1}$$

26.
$$\lim_{x\to\infty} \frac{5x}{3x^7 - x^3 + 4}$$
29.
$$\lim_{x\to\infty} \frac{3 - 4x - 2x^3}{5x^3 - 8x + 1}$$
37.
$$\lim_{x\to -3^-} \frac{5x^2 + 14x - 3}{x^2 + 3x}$$
41.
$$\lim_{x\to 1} \left(1 + \frac{1}{x-1}\right)$$
42.
$$\lim_{x\to -\infty} -\frac{x^5 + 2x^3 - 1}{x^5 - 4x^2}$$
45.
$$\lim_{x\to 0} \frac{5}{x + x^2}$$
52.
$$\lim_{x\to 0} \left|\frac{1}{x}\right|$$

61. The population of a certain small city t years from now is predicted to be

$$N = 50000 - \frac{2000}{t+1}$$

. Find the population in the long run; that is, find $\lim_{t\to\infty} N$.