Section 1.3

Some Basic Limits: Let b and c be real numbers, and let n be a positive integer.

    1. $\lim_{x \to c} b = b$ 2. $\lim_{x \to c} x = c$ 3. $\lim_{x \to c} x^n = c^n$

Limits of Polynomial and Rational Functions: If p is a polynomial function and c is a real number, then
$$\lim_{x \to c} p(x) = p(c)$$

If r is a rational function given by $r(x) = p(x)/q(x)$ and c is a real number such that $q(c) \neq 0$, then
$$\lim_{x \to c} r(x) = r(c) = \frac{p(c)}{q(c)}.$$

Two Special Trigonometric Limits:

                       1. $\lim_{x \to 0} \dfrac{\sin x}{x} = 1$ 2. $\lim_{x \to 0} \dfrac{1 - \cos x}{x} = 0$

1) Find the following limits:

    a) $\lim_{x \to 2} 2x^2$

    b) $\lim_{x \to -1}(3x^3 - 5x)$

    c) $\lim_{x \to 4} \dfrac{3x+2}{5-2x}$

    d) $\lim_{x \to 0}(3x^2 - 5x + 1)^5$

2) Find the following limits:

    a) $\lim_{x \to 3} \sqrt{2x^2 - 3x}$

    b) $\lim_{x \to -2} \sqrt[3]{-7 - 5x^2}$

3) Find the following limits:

a) $\lim_{x \to \frac{\pi}{3}} \cos 2x$

b) $\lim_{x \to \frac{3\pi}{4}} \tan^2 x$

4) Find the following limits:

a) $\lim_{x \to 2} \frac{x^2 - 6x + 8}{x - 2}$

b) $\lim_{x \to -1} \frac{x^3 + 1}{x + 1}$

5) Find $\lim_{x \to 0} \frac{\sqrt{2x+4} - 2}{3x}$.

6) Find $\lim_{x \to 0} x^2 \sin \frac{1}{x}$.

Homework for this section: Read the section and watch the videos/tutorials. Then do these problems in preparation for the quiz: #19, 25, 36, 39, 43, 45, 49, 53, 63, 73, 83