Warm-up Problems

1. Determine your speed in each of the situations:

   (a) You jump in your car at 10AM, drive 100 miles and arrive at your destination at noon.
   **Solution:** Possible answer: Average Speed is 50 miles per hour

   (b) You leave your dorm room at 10PM for a party 2 miles away. You walk there and arrive at 10:30PM.
   **Solution:** Possible answer: Average Speed is 4 miles per hour

2. Find the slope between the line determined by the given points:

   (a) \((2, 3)\) and \((5, 10)\)
   **Solution:** \(\frac{7}{3}\)

   (b) \((10, 13)\) and \((101, 47)\)
   **Solution:** \(\frac{34}{91}\)

Lecture Problems

3. Compute the following limits. Be sure to try to do these graphically, with a table, and algebraically.

   (a) \(\lim_{x \to 4} \frac{1}{x} = \frac{1}{4}\)

   (b) \(\lim_{h \to 1} \frac{h^2 - h}{h - 1} = 1\)

   (c) \(\lim_{h \to 0} \frac{(1+h)^2 - 1}{h} = 1\)

   (d) \(\lim_{x \to -1} \frac{x}{x+1} = \pm \infty\)

   (e) \(\lim_{x \to -1} \frac{x^2 + x}{x+1} = -1\)

4. Consider the graph of the function \(F(x)\) below.

![Graph of F(x)]
(a) \( F(0) = 0 \)  \hspace{1cm} (d) \( F(3) = 3 \)
(b) \( F(1) = 0 \)  \hspace{1cm} (e) \( F(4) = -1 \)
(c) \( F(2) = 2 \)  \hspace{1cm} (f) \( F(5) = -1 \)

5. Same graph and function as the previous problem.

(a) \( \lim_{x \to 1} F(x) = 0 \)  \hspace{1cm} (c) \( \lim_{x \to 3} F(x) = \text{DNE} \)
(b) \( \lim_{x \to 2} F(x) = 1 \)  \hspace{1cm} (d) \( \lim_{x \to 4} F(x) = -1 \)

6. Same graph and function.

(a) \( \lim_{x \to 1^-} F(x) = 0 \)  \hspace{1cm} (e) \( \lim_{x \to 3^-} F(x) = 3 \)
(b) \( \lim_{x \to 1^+} F(x) = 0 \)  \hspace{1cm} (f) \( \lim_{x \to 3^+} F(x) = 0 \)
(c) \( \lim_{x \to 2^-} F(x) = 1 \)  \hspace{1cm} (g) \( \lim_{x \to 4^-} F(x) = -1 \)
(d) \( \lim_{x \to 2^+} F(x) = 1 \)  \hspace{1cm} (h) \( \lim_{x \to 4^+} F(x) = -1 \)