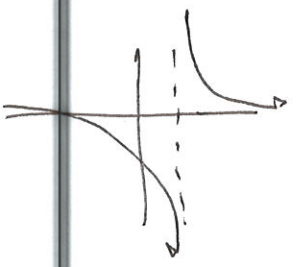
MTH 261, Quiz #2, Spring 2019 Name KEY

Instructions: You must show all work to receive full credit for the problems below. You may check your work with a calculator, but answers without work will receive minimal credit. Use exact answers unless the problem starts with decimals or you are specifically asked to round.

1. Evaluate $\lim_{x\to 2} \frac{x^2+3x-10}{x^2-4x+4}$ algebraically.

$$\lim_{x\to 2} \frac{(x-2)(x+5)}{(x-2)(x-2)} = DNE$$



2. Based on data from Major League Baseball, the average price of a ticket to a major league game can be approximated by $p(x) = 0.03x^2 + 0.56x + 8.63$, where x is the number of years after 1991, and $p(x)$ is in dollars.
   a. Find $p(4), p(17)$.

$p(4) =$ 11.35

$p(17) =$ 26.82

   b. Find $\frac{p(17)-p(4)}{17-4}$ and interpret the result.

1.19 the average rate of change per year in price of ticket between 1995 and 2008

3. Find the derivative of the function $f(x) = x^2 - x$ using the limit definition.

$$\lim_{h\to 0} \frac{(x+h)^2-(x+h)-(x^2-x)}{h} = \lim_{h\to 0} \frac{x^2+2xh+h^2-x-h-x^2+x}{h}$$

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