

Today's Plan:

Learning Target (standard): I will review graphing functions and describing how the concept of a limit applies to specific x-values. I will calculate limits analytically.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work and take a quiz on limits.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide quiz problems.

Assessment: Board work, homework check and quiz

Differentiation: Students will work at the board, go over and correct homework at their seats, and actively engage in a quiz.

Assignment:

Evaluate the limits.

$$f(x) = \begin{cases} 2x - 3, & x \leq -2 \\ x - 5, & -2 < x \leq 4 \\ x^2, & x > 4 \end{cases}$$

$$a) \lim_{x \rightarrow -2} f(x) = -7$$

$$b) \lim_{x \rightarrow 0} f(x) = -5$$

$$c) \lim_{x \rightarrow 4} f(x) = DNE$$

$$d) \lim_{x \rightarrow 6} f(x) = 36$$

Evaluate the limits.

$$f(x) = \begin{cases} x^2 + 2x, & x \leq 1 \\ 2x, & x > 1 \end{cases}$$

$$a) \lim_{x \rightarrow -1} f(x) = -1$$

$$b) \lim_{x \rightarrow 0} f(x) = 0$$

$$c) \lim_{x \rightarrow 2} f(x) = 4$$

$$d) \lim_{x \rightarrow 1} f(x) = DNE$$

Evaluate the limits.

$$f(x) = \begin{cases} 1 - x, & -1 \leq x < 2 \\ 2x - 5, & 2 < x < 4 \\ x^2, & x \geq 4 \end{cases}$$

$$a) \lim_{x \rightarrow -1} f(x) = DNE$$

$$b) \lim_{x \rightarrow 2} f(x) = -1$$

$$c) \lim_{x \rightarrow 4} f(x) = DNE$$

$$d) \lim_{x \rightarrow 3} f(x) = 1$$

Packet #1,3-5,10-12,20,21

Evaluate the limit.

$$\begin{aligned}
 \lim_{h \rightarrow 0} \frac{1}{h} \left(\frac{1}{x+h} - \frac{1}{x} \right) &= \lim_{h \rightarrow 0} \frac{1}{h} \left(\frac{x - (x+h)}{x(x+h)} \right) \\
 &= \lim_{h \rightarrow 0} \frac{1}{h} \left(\frac{x - x - h}{x(x+h)} \right) \\
 &= \lim_{h \rightarrow 0} \frac{1}{\cancel{h}} \left(\frac{-\cancel{h}}{x(x+h)} \right) \\
 &= \lim_{h \rightarrow 0} \frac{-1}{x(x+h)} \\
 &= \frac{-1}{x(x+0)} \\
 &= -\frac{1}{x^2}
 \end{aligned}$$

Evaluate the limit.

$$\begin{aligned}
 \lim_{x \rightarrow 1} \frac{2x-2}{x^3 + 2x^2 - x - 2} &= \lim_{x \rightarrow 1} \frac{2(x-1)}{x^2(x+2) - 1(x+2)} \\
 &= \lim_{x \rightarrow 1} \frac{2(x-1)}{(x+2)(x^2-1)} \\
 &= \lim_{x \rightarrow 1} \frac{2\cancel{(x-1)}}{(x+2)(x+1)\cancel{(x-1)}} \\
 &= \lim_{x \rightarrow 1} \frac{2}{(x+2)(x+1)} \\
 &= \frac{2}{(1+2)(1+1)} \\
 &= \frac{2}{6} \\
 &= \frac{1}{3}
 \end{aligned}$$