goals:

- Know how to evaluate limits algebraically (that is, using the limit laws from this section)
- Recognize when a limit needs some algebraic manipulation and when it doesn't.
- Understand the idea behind the Squeeze Theorem.

Recall that in the Section 2.2 notes we established $\boxed{\lim_{x\to 0} \frac{\sin(x)}{x} = 1.}$

Rule: Example

1. $\lim_{x\to 5} 14 =$

2. $\lim_{x\to 5} x =$

3. $\lim_{x\to 0} \frac{\sin(x)}{x} + (2x + \sqrt{2}) =$

4. $\lim_{x\to 0} \lim_{x\to 0} \frac{\sin(x)}{x} - (2x + \sqrt{2}) =$

5. $\lim_{x\to 0} \lim_{x\to 0} \frac{35\sin(x)}{x} =$

6. $\lim_{x\to 4} (5x + 20)(x - 2) =$

7. $\lim_{x\to 4} \frac{5x + 20}{x - 2} =$

8. $\lim_{x\to -2} (8 + 5x)^5 =$

9. $\lim_{x\to -1} \sqrt{15 - x} =$

1. lesson:

$$\lim_{x \to \sqrt{2}} 5x - \sqrt{8x^2 - 1}$$

2. lesson:

$$\lim_{t \to 2} \frac{x^2 - 4}{x - 2}$$

3. lesson:

$$\lim_{x \to 5} \frac{3 - \sqrt{x + 4}}{5 - x}$$

4. lesson:

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

5. lesson:

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

6. The last two problems reference the function $f(x) = \begin{cases} \frac{1}{2x} & \text{if } 0 < x \leq 2 \\ 0 & \text{if } 2 < x \end{cases}$

   (a) Explain why $\lim_{x \to 2} f(x)$ does not exist.

   (b) Evaluate $\lim_{x \to 2^+} e^{f(x)}$.

7. Squeeze Theorem