

HW 5: Section 1.5

Due: Thursday, September 19th in SQRC by 9pm

Learning Goals:

- Evaluate limits that possibly limit to ∞ or $-\infty$.
- Evaluate limits as x approaches ∞ or $-\infty$.
- Be able to use tables, graphs, and symbolic computation to evaluate limits involving ∞ .

Questions:

1. Evaluate the limit or state that it limits to ∞ , $-\infty$ or DNE.

$$\lim_{x \rightarrow -1} \frac{1-x}{(x+1)^2}$$

2. Evaluate the limit or state that it limits to ∞ , $-\infty$ or DNE.

$$\lim_{x \rightarrow \pi/2} x \sec^2(x)$$

3. Evaluate the limit or state that it limits to ∞ , $-\infty$ or DNE.

$$\lim_{x \rightarrow 0^+} \ln(x \sin(x))$$

4. Evaluate the limit or state that it limits to ∞ , $-\infty$ or DNE.

$$\lim_{x \rightarrow 0^+} \arctan(\ln(x))$$

5. Evaluate the limit or state that it limits to ∞ , $-\infty$ or DNE.

a) $\lim_{x \rightarrow \infty} \frac{2x^2 - 1}{4x^3 - 5x - 1}$

b) $\lim_{x \rightarrow \infty} \frac{2x^3 - 1}{4x^3 - 5x - 1}$

c) $\lim_{x \rightarrow \infty} \frac{2x^4 - 1}{4x^3 - 5x - 1}$

6. Use graphical or numerical evidence (or both!) to conjecture a value for the indicated limits

$$\lim_{x \rightarrow \infty} \frac{\ln(2 + e^{2x})}{\ln(1 + e^x)}$$