

Here we will inquire about the notion of limit when  $x$  goes to infinity or negative infinity.

1. Look at the definition of a limit  $\lim_{x \rightarrow a} f(x)$  that we have defined in class.

Having this definition in mind, how can we define the limit  $\lim_{x \rightarrow \infty} f(x)$ ? In other words, how can modify the definition to make it work for  $x$  going to infinity while keeping the notion pre-determined level of precision?

2. Look at the graph of  $f(x) = \frac{6x^2 - 5x + 2}{2x^2}$ . Use this definition and the graph to determine  $\lim_{x \rightarrow \infty} f(x)$  and  $\lim_{x \rightarrow -\infty} f(x)$ . Do your answers make sense with respect to what you see on the graph?

3. Again, looking at the graph of  $g(x) = \sin(\pi x)$  and at your definition, determine  $\lim_{x \rightarrow \infty} f(x)$  and  $\lim_{x \rightarrow -\infty} f(x)$ ?