

Section 2.6: Limits at Infinity; Horizontal Asymptotes

(1) What does it mean to take the limit of a function as $x \rightarrow \infty$ or $x \rightarrow -\infty$?

(2) What is the definition of a horizontal asymptote? Can a function cross its horizontal asymptote? Make sure you know the difference between a horizontal and vertical asymptote and the limit definition of each.

(3) What algebraic technique do we use to evaluate limits of rational functions at ∞ ?
Note: this techniques should only be used as $x \rightarrow \infty$ or $x \rightarrow -\infty$. For other functions, we can also multiply (top and bottom) by the conjugate or use the Squeeze Theorem.

(4) When we have a square root function and we are dividing by x^2 , we have to be careful since $\sqrt{x^2} = |x| \neq x$ when $x < 0$. Show an example where this comes up.

(5) What is $\lim_{x \rightarrow \infty} f(x)$? for $f(x) = \ln(x), e^x, \sin(x), \cos(x), x^n$.