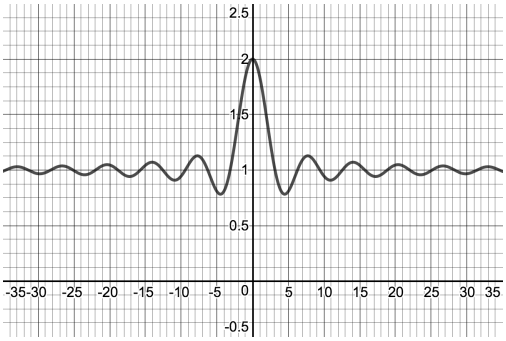
§2.5: Limits at Infinity

1.] Evaluate $\lim_{x\to\infty} 1 + \dfrac{\sin(x)}{x}$. Does this function have a horizontal asymptote?



2.] Determine the limits at infinity for the following polynomial: $f(x) = 4x^4 - 2x^3 + x - 100$

3.] Determine the end behavior of the following rational functions:

a.) $f(x) = \dfrac{2x+1}{x^2-1}$

b.) $g(x) = \dfrac{20x^4 - 6x^2 - 10}{4x^4 + 8x^2 + 1}$

c.) $h(x) = \dfrac{-x^3 + x - 5}{3x + 1}$

4.] Determine the end behavior of the following algebraic function:

$$f(x) = \frac{4x^3 + 1}{\sqrt{16x^6 + x^2 - 1}}$$

5.] Determine the end behavior of the following transcendental functions:

a.) $f(x) = -3e^{-x}$

b.) $g(x) = \ln\left(\frac{1}{x}\right)$

c.) $h(x) = \sin(x)$