

### Horizontal and Vertical Asymptotes

1. A line  $y = b$  is a horizontal asymptote of the graph  $y = f(x)$  if either  
 $\lim_{x \rightarrow \infty} f(x) = b$  or  $\lim_{x \rightarrow -\infty} f(x) = b$ . (Compare degrees of functions in fraction)
2. A line  $x = a$  is a vertical asymptote of the graph  $y = f(x)$  if either  
 $\lim_{x \rightarrow a^+} f(x) = \pm\infty$  or  $\lim_{x \rightarrow a^-} f(x) = \pm\infty$  (Values that make the denominator 0 but not numerator)