2.7 Limits at Infinity
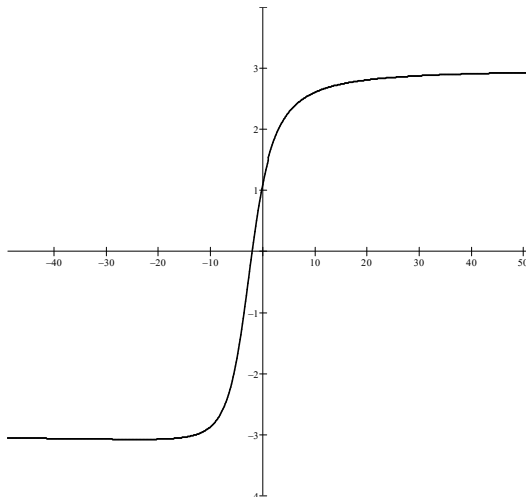
The notation $x \to \infty$ indicates that x increases without bound.

The notation $x \to -\infty$ indicates that x decreases (through negative values) without bound.

1. Discuss the asymptotic behavior of the graph.
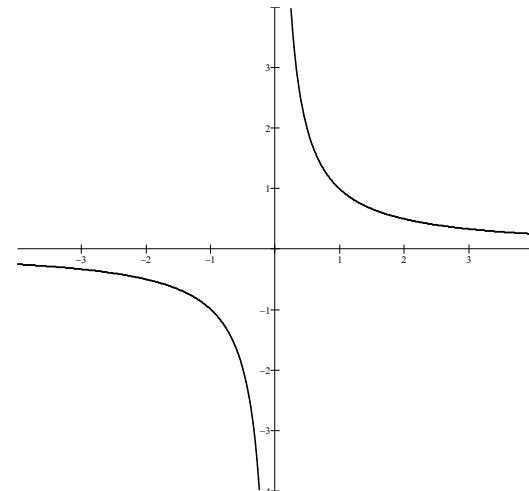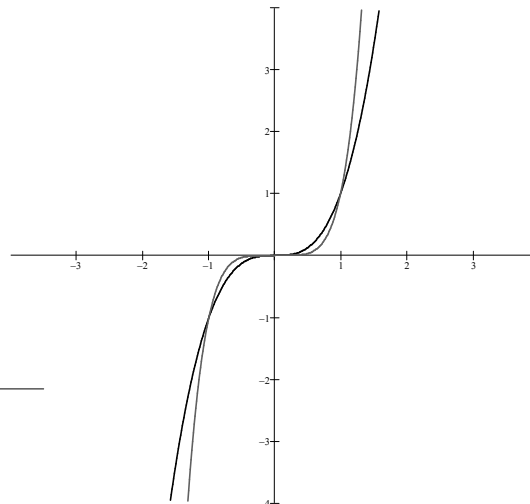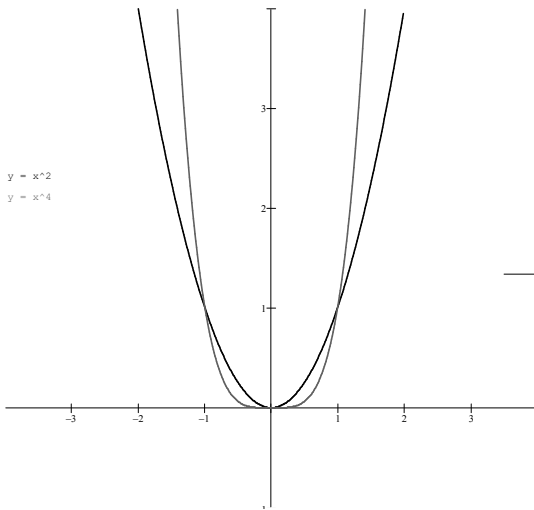

Limits at infinity do not always exist.

- $f(x) = \sin x$

- $f(x) = x^n \ n > 0$ $f(x) = x^n \ n > 0$ $f(x) = x^{-n} \ n > 0$

    n is even   n is odd

y = x^2
y = x^4

2. Calculate $\lim\limits_{x \to \infty} 5 - \dfrac{2}{x^2}$

3. Calculate $\displaystyle\lim_{x\to\infty} \frac{4x^2-5x+7}{10x+\ 3}$

4. Calculate $\displaystyle\lim_{x\to\pm\infty} \frac{3x-2}{\sqrt{2x^2+1}}$

AP Calculus