

## Solving Infinite Limits: $\lim_{x \rightarrow \pm\infty} f(x)$

1. Plug it in

- Be careful evaluating infinite values

2. Turn the expression into a single fraction

- If the expression is the sum or difference of two fractions, find a common denominator
- If you have an expression without fractions that contains a square root, multiply by the conjugate  
(e.g.  $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 3x} - x)$ )

3. Divide by the dominant term

- Identify the dominant term ( $x^k$ , where  $k$  is the highest power)
  - You may choose the dominant term overall, or the dominant term of the denominator. I recommend choosing from the denominator
- Divide each term by  $x^k$ . Remember that if we are dividing by  $x^k$ , then anything under a square root is divided by  $x^{2k}$ .

4. Evaluate as  $x \rightarrow \infty$

- Most terms should approach 0
- Whatever you are left with should be your answer