

1. Compute

$$\lim_{x \rightarrow \infty} \frac{x^2 - 1}{x^2 + 1}$$

2. Compute

$$\lim_{x \rightarrow -\infty} \frac{x - 1}{|x + 2|}$$

3. Compute

$$\lim_{x \rightarrow -\infty} \frac{\sqrt{1+2x^4}}{2-x^2}.$$

4. Compute

$$\lim_{x \rightarrow \infty} \sqrt{9x^2+1} - 3x.$$

Hint: Multiply by $1 = \frac{\sqrt{9x^2+1}+3x}{\sqrt{9x^2+1}+3x}$.

5. Compute

$$\lim_{x \rightarrow \infty} \frac{2 + e^x}{1 - e^x}.$$

6. Compute

$$\lim_{x \rightarrow -\infty} \frac{2 + e^x}{1 - e^x}.$$

7. Compute

$$\lim_{x \rightarrow \infty} \ln(3 + x) - \ln(1 + x)$$

8. Compute

$$\lim_{x \rightarrow \infty} \arctan(2^{-x})$$