

1. Compute

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

2. Compute

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

3. Compute

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

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

4. Compute

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

5. Compute

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

6. Compute

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

7. Compute

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

8. Compute

$$\lim_{x \rightarrow \infty} \frac{x^3 - 12x + 1}{x^4 + 7}$$

9. Compute

$$\lim_{x \rightarrow -\infty} \frac{x^4 + 7}{x^3 - 12x + 1}$$