

HA Limit Practice Problems

Remember if you get $\frac{\infty}{\infty}$ or $(\infty - \infty)$ this tells you nothing about the problem

1. Compute $\lim_{x \rightarrow \infty} \frac{100}{x^2 + 5} = 0$

2. Compute $\lim_{x \rightarrow \infty} \frac{7}{x^3 - 20} = 0$

3. Compute $\lim_{x \rightarrow \infty} 3x^3 - 1000x^2 = \infty$

4. Compute $\lim_{x \rightarrow \infty} x^4 + 5x^2 + 1 = \infty$

5. Compute $\lim_{x \rightarrow \infty} x^5 - x^2 + x - 10 = \infty$

6. Compute $\lim_{x \rightarrow \infty} \frac{x+7}{3x+5} = \frac{1}{3}$

7. Compute $\lim_{x \rightarrow \infty} \frac{7x^2 + x - 100}{2x^2 - 5x} = \frac{7}{2}$

8. Compute $\lim_{x \rightarrow \infty} \frac{x^2 - 3x + 7}{x^3 + 10x - 4} = \frac{x^2}{x^3} = \frac{1}{x} \Rightarrow 0$

9. Compute $\lim_{x \rightarrow \infty} \frac{7x^2 - x + 11}{4 - x} = \frac{7x^2}{-x} = -7x = -\infty$

10. Compute $\lim_{x \rightarrow \infty} \sqrt{\frac{x^3 + 7x}{4x^3 + 5}} = \sqrt{\frac{x^3}{4x^3}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$

11. Compute $\lim_{x \rightarrow \infty} \frac{x+8}{\sqrt{2x^2+3}}$ and $\lim_{x \rightarrow \infty} \frac{x+8}{\sqrt{2x^2+3}}$ Do sign first $\frac{-}{\sqrt{(-)^2}} = \frac{-}{+} = -$ answer
then do just ∞ and $\frac{x}{x} = 1 = \boxed{-1}$

12. $\lim_{x \rightarrow \infty} e^x = \infty$ $\lim_{x \rightarrow -\infty} e^x = 0$ $\lim_{x \rightarrow \infty} e^{-x} = 0$ $\lim_{x \rightarrow -\infty} e^{-x} = \infty$

13. $\lim_{x \rightarrow \infty} e^{2-4x-8x^2} = e^{-8x^2} = 0$ $\lim_{t \rightarrow \infty} e^{t^4-5t^2+1} = e^{(\infty)^4} = \infty$ $\lim_{z \rightarrow 0^+} e^{\frac{1}{z}} = e^{\infty} = \infty$

Level *** $\lim_{x \rightarrow \infty} \frac{6e^{4x} - e^{-2x}}{8e^{4x} - e^{2x} + 3^{-x}} = \frac{6}{8} = \frac{3}{4}$