

Calculus I**Section 2.5B – Limits as $x \rightarrow \pm\infty$**

Determine the following limits. If the limit does not exist, specify whether it approaches $\pm\infty$.

1.
$$\lim_{x \rightarrow \infty} \frac{-5 + \frac{7}{x}}{3 - \frac{1}{x^2}}$$

2.
$$\lim_{x \rightarrow -\infty} \frac{2x + 3}{6x + 7}$$

3.
$$\lim_{x \rightarrow \infty} \frac{2x^3 + 7}{x^3 - x^2 + x + 7}$$

4.
$$\lim_{x \rightarrow -\infty} \frac{x + 1}{x^2 + 3}$$

5.
$$\lim_{x \rightarrow -\infty} \frac{1 - 12x^3}{4x^2 + 12}$$

6.
$$\lim_{x \rightarrow \infty} \frac{3x^2 - 6x}{4x - 8}$$

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

8.
$$\lim_{x \rightarrow -\infty} \frac{10x^5 + x^4 + 31}{x^6}$$

9.
$$\lim_{x \rightarrow \infty} \frac{7x^3}{x^3 - 3x^2 + 6x}$$

10.
$$\lim_{x \rightarrow -\infty} 3x^7 - 2x^2 + x + 1$$

11.
$$\lim_{y \rightarrow \infty} 2y^4 + 5y^2 - y + 6$$

12.
$$\lim_{x \rightarrow -\infty} -x^4 + 31$$

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13. $\lim_{x \rightarrow -\infty} \frac{-15x}{7x+4}$

14. $\lim_{x \rightarrow -\infty} \frac{11x+2}{2x^3-1}$

15. $\lim_{x \rightarrow \infty} \frac{-4x^3+7x}{2x^2-3x-10}$

16. $\lim_{x \rightarrow \infty} \sqrt{\frac{3x^7-4x^2}{2x^7+1}}$

17. $\lim_{x \rightarrow \infty} \sqrt{\frac{4x^2+1}{3x^3}}$

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

19. $\lim_{x \rightarrow \infty} \frac{\sqrt{5x^2+x}}{x-7}$

20. $\lim_{x \rightarrow -\infty} \frac{\sqrt{4x^2+3}}{2x-1}$

21. $\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2+6}}{4x+1}$

22. $\lim_{x \rightarrow \infty} \sqrt{x^2-6} - x$

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

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