

1.3 Asymptotes

Calculus

Name: _____

CA #2

Identify the **vertical** asymptotes of each function.

1. $f(x) = \frac{x^3 - 16x^2 + 63x}{x^2 - 7x}$

2. $f(x) = \frac{2x^2 + 11x + 9}{x - 9}$

Identify the **horizontal** asymptotes of each function.

3. $f(x) = \frac{\sqrt{9x^6 + 2x^2 + x}}{x^3 + 9x^2}$

4. $f(x) = \frac{5x^2}{\sqrt{5x^4 - 2x}}$

Evaluate each limit.

5. $\lim_{x \rightarrow \infty} \frac{2x^4 + 3x^3 + 4}{5x^7 + 2x^4 + 2x^3}$

6. $\lim_{x \rightarrow \infty} 4^{-x} + 1$

7. $\lim_{x \rightarrow \infty} \frac{6x^6 - 3x^3 + 5}{2x^3 + x^8 + 2x^4}$

8. $\lim_{x \rightarrow \infty} -x \cos x$

9. $\lim_{x \rightarrow \infty} \sin\left(\frac{4x + \pi x^2}{x^3}\right)$

10. $\lim_{x \rightarrow \infty} \sin(6x)$

11. $\lim_{x \rightarrow \infty} \frac{-5x^4 - 3x^2 - 6}{10x^4 + 6x + 11}$

12. $\lim_{x \rightarrow \infty} \cos\left(\frac{x + 4\pi x^2}{10 - 2x^2}\right)$

13. $\lim_{x \rightarrow \infty} \frac{2x^2 + 3x^4 + 1}{6x^2 + 5x - 10}$

14. $\lim_{x \rightarrow \infty} \left(3 \sin \frac{1}{x}\right)$

15. $\lim_{x \rightarrow \infty} \frac{e^3}{3^x}$

16. $\lim_{x \rightarrow \infty} \left(\frac{\sin x}{x}\right)$

Answers to 1.3 CA #2

1. None	2. $x = 9$	3. $y = 3$ and $y = -3$	4. $y = \sqrt{5}$	5. 0	6. 1	7. 0	8. DNE, Oscillating.
9. 0	10. DNE, Oscillating.	11. $-\frac{1}{2}$	12. 1	13. ∞	14. 0	15. 0	16. 0