

1.15 Limits at Infinity and Horizontal Asymptotes

Calculus

Name: _____

Identify the horizontal asymptotes of each function.

1. $f(x) = \frac{(x+6)(4x-1)}{(2x-7)^2}$	2. $f(x) = \frac{(x-5)(2-2x)}{(4x+1)^2}$
3. $f(x) = \frac{\sqrt{16x^2+3x}}{3x}$	4. $f(x) = \frac{\sqrt{7x^8-2x^2+2x}}{x^4-3x}$

Evaluate each limit.

5. $\lim_{x \rightarrow \infty} \frac{2x^4 - 3x^3 + 1}{x^5 - x^4 + 4x^3}$	6. $\lim_{x \rightarrow \infty} 3^{-x} - 2$	7. $\lim_{x \rightarrow \infty} \frac{x^3 - 2x^2 + 10}{5x^3 - x^6 + 3x}$	8. $\lim_{x \rightarrow \infty} x \sin x$
9. $\lim_{x \rightarrow \infty} \cos\left(\frac{4x + \pi x^2}{x^3}\right)$	10. $\lim_{x \rightarrow \infty} \cos(x)$	11. $\lim_{x \rightarrow \infty} \frac{2x^4 - 3x^2 - 6}{3x^4 + 6x + 11}$	12. $\lim_{x \rightarrow \infty} \sin\left(\frac{x + 4\pi x^2}{10 - 16x^2}\right)$
13. $\lim_{x \rightarrow \infty} \frac{6x^2 - 9x^4 + 1}{2x^2 + x + 600}$	14. $\lim_{x \rightarrow \infty} \left(4 \cos \frac{1}{x}\right)$	15. $\lim_{x \rightarrow \infty} \frac{e^6}{2^x}$	16. $\lim_{x \rightarrow \infty} \left(\frac{\cos x}{x}\right)$

Answers to 1.15 CA #2

1. $y = 1$	2. $y = -\frac{1}{8}$	3. $y = \frac{3}{4}$ and $y = -\frac{3}{4}$	4. $y = \sqrt{7}$	5. 0	6. -2	7. 0	8. DNE, Oscillating.
9. 1	10. DNE, Oscillating.	11. $\frac{3}{2}$	12. $-\frac{2}{\sqrt{2}}$	13. ∞	14. 4	15. 0	16. 0