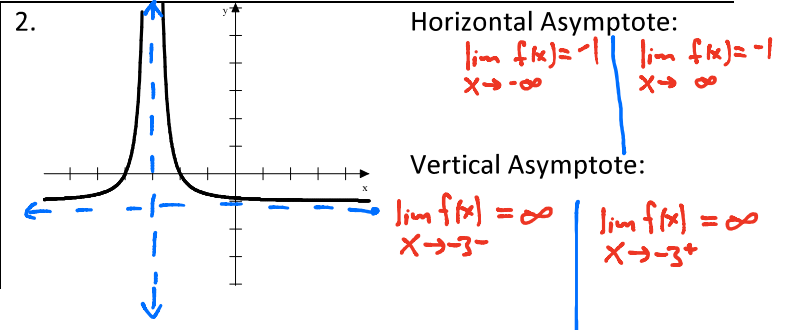
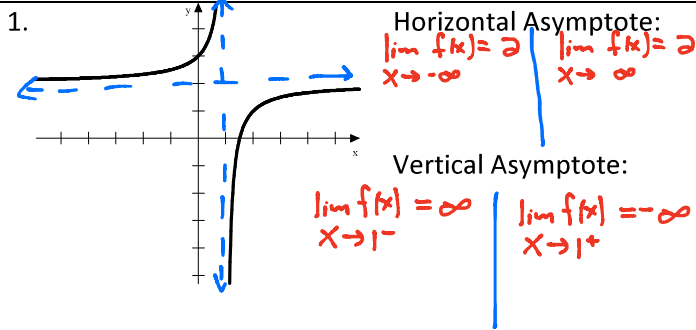


2.4 Practice – Limits to Infinity

Name: _____

Pre-Calculus

For 1-2, use limit notation to represent the horizontal and vertical asymptotes. Then sketch them on the graph.



For 3-8, use a graphing calculator to find the horizontal asymptotes. Use limit notation to represent both the left and the right side end behavior.

3. $f(x) = \frac{2x-4}{x-8}$ $\lim_{x \rightarrow -\infty} f(x) = 2$ $\lim_{x \rightarrow \infty} f(x) = 2$

4. $f(x) = \frac{2.6}{1+e^{-x}} - 2$ $\lim_{x \rightarrow -\infty} f(x) = -2$ $\lim_{x \rightarrow \infty} f(x) = 0.6$

5. $f(x) = \frac{10x-13x^3}{39x^3+89x^2+x}$ $\lim_{x \rightarrow -\infty} f(x) = -\frac{1}{3}$ $\lim_{x \rightarrow \infty} f(x) = -\frac{1}{3}$

6. $f(x) = \frac{5+x^2}{12-3x^2+9x}$ $\lim_{x \rightarrow -\infty} f(x) = -\frac{1}{3}$ $\lim_{x \rightarrow \infty} f(x) = -\frac{1}{3}$

7. $f(x) = \frac{6}{1+e^{-x}} + 2$ $\lim_{x \rightarrow -\infty} f(x) = 2$ $\lim_{x \rightarrow \infty} f(x) = 8$

8. $f(x) = \frac{3.5}{1+e^{-x}} + 1$ $\lim_{x \rightarrow -\infty} f(x) = 1$ $\lim_{x \rightarrow \infty} f(x) = 4.5$

For 9-11, fill in the table and use that information to identify the vertical asymptote. Use limit notation to represent the behavior of the graph at the vertical asymptote.

9. $f(x) = \frac{5x^2-4x-1}{10x^2-38x-8}$

x	3	3.9	3.999	4	4.001	4.1	5
f(x)	-1	-14.5	-1500	dne	1500.5	15.5	2

$\lim_{x \rightarrow 4^-} f(x) = -\infty, dne$

$\lim_{x \rightarrow 4^+} f(x) = \infty, dne$

$\therefore VA @ x=4$

10. $f(x) = \frac{3x^2-20x-7}{9x^2+21x+6}$

x	-2.1	-2.01	-2.001	-2	-1.999	-1.99	-1.9
f(x)	30.3	300.3	3000.3	dne	-2999.7	-299.7	-29.7

$\lim_{x \rightarrow -2^-} f(x) = \infty, dne$

$\lim_{x \rightarrow -2^+} f(x) = -\infty, dne$

$\therefore VA @ x = -2$

Choose your own domain values!

11. $f(x) = \frac{x}{1-x}$

x	.9	.99	.999	1	1.001	1.01	1.1
f(x)	9	99	999	dne	-1001	-101	-11

$\lim_{x \rightarrow 1^-} f(x) = \infty, dne$

$\lim_{x \rightarrow 1^+} f(x) = -\infty, dne$

$\therefore VA @ x=1$