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Rational Functions: Behavior

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Preparation:
Students need to know the basics about end behavior. This video demonstrates end behavior.
V https://www.youtube.com/watch?v=LFZH0IUBVEM

To assess student understanding of end behavior, have students use this dynamic quizmaster.
Q http://www.mathguide.com/cgi-bin/quizmasters3/EB.cgi

The teacher also has to have discussed finding the behavior at certain x-values, especially at values that are not part of a rational function's domain. An example has been provided for student/teacher discussion.

Teacher Directions:
The teacher should place students in groups of 2 – 3 students to work on the worksheet that has been provided.
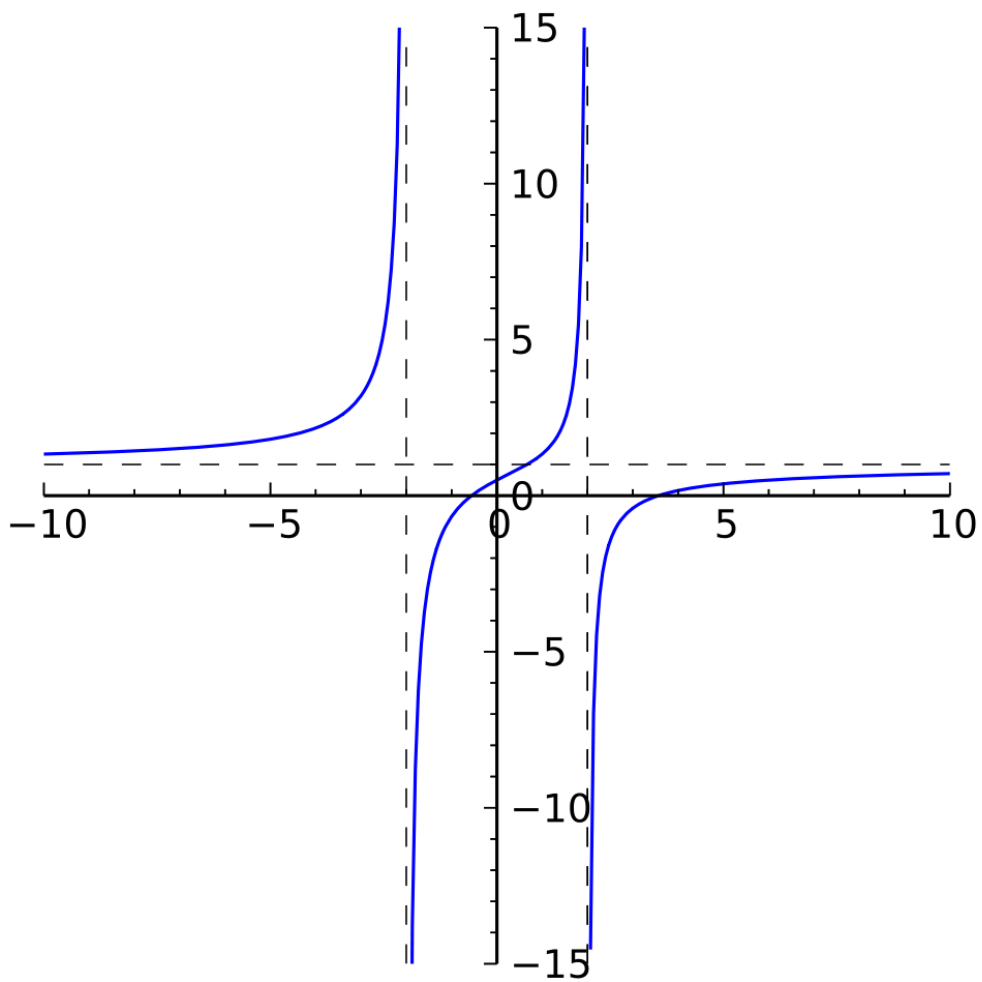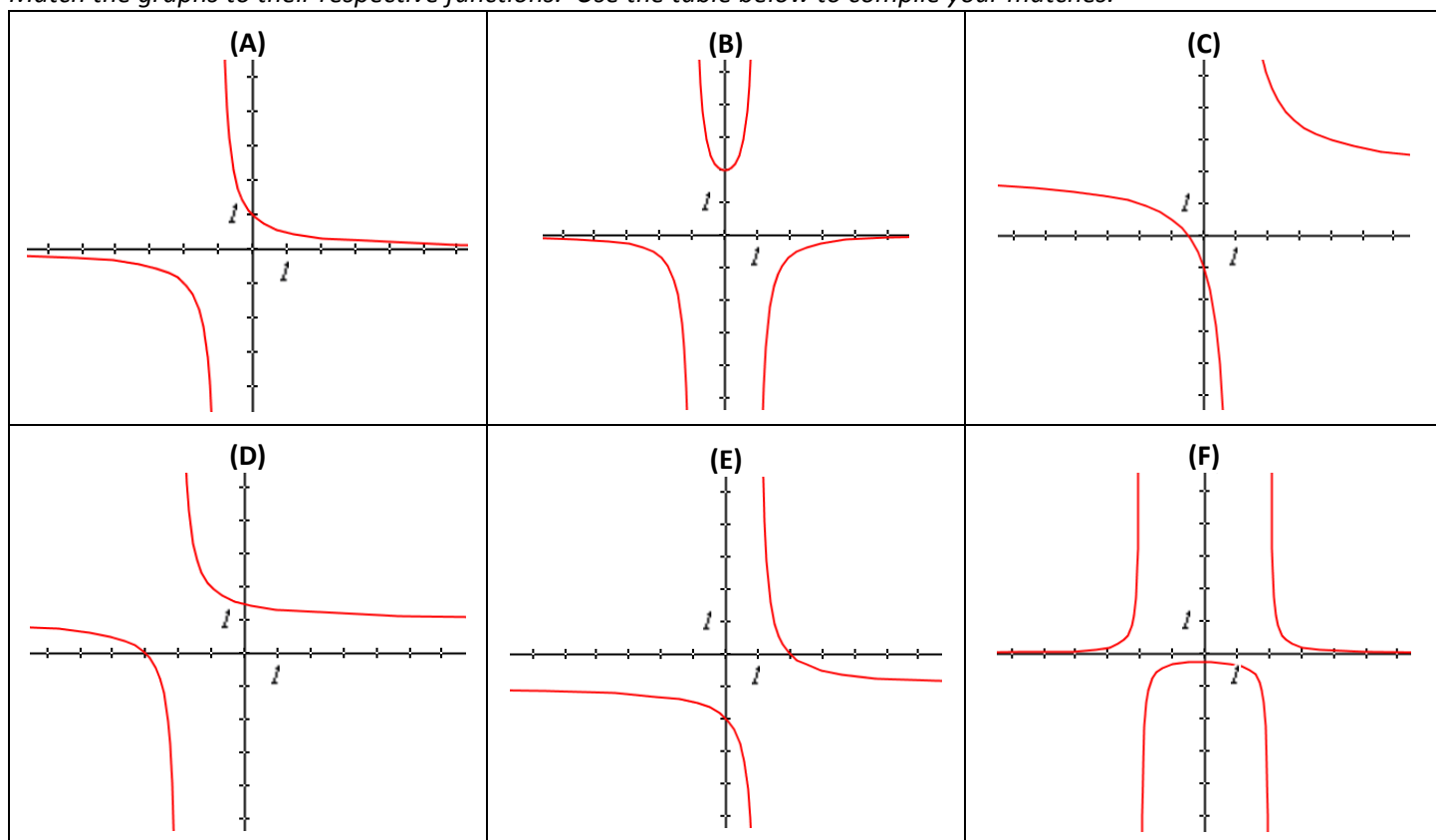
Determine:

$$\lim_{x \to -\infty} f(x) =$$

$$\lim_{x \to +\infty} f(x) =$$

$$\lim_{x \to 1^+} f(x) =$$

$$\lim_{x \to 1^-} f(x) =$$

Match the graphs to their respective functions. Use the table below to compile your matches.

(A)	(B)	(C)

(D)	(E)	(F)

1) $r(x) = \dfrac{4x-1}{x+1}$

2) $t(x) = \dfrac{2x+1}{x-1}$

3) $k(x) = -1 + \dfrac{1}{x-1}$

4) $a(x) = 1 + \dfrac{1}{x+2}$

5) $h(x) = \dfrac{1}{x+1}$

6) $c(x) = 2 - \dfrac{2}{x+3}$

7) $j(x) = \dfrac{-2}{x^2-1}$

8) $z(x) = \dfrac{-3}{x-2}$

9) $f(x) = \dfrac{1}{x^2-4}$

Function	Graph	Domain	Asymptotes	Describe Behavior at Vertical Asymptote(s)
1				
2				$\lim\limits_{x\to\_}f(x) =$ $\qquad$ $\lim\limits_{x\to\_+}f(x) =$
3				
4				
5				
6				
7				
8				
9				

Sketch the graph of a rational function, called $f(x)$, that has the given characteristics.

10) $\lim\limits_{x \to -\infty} f(x) = 1$, $\lim\limits_{x \to +\infty} f(x) = 1$,

$\lim\limits_{x \to 3^-} f(x) = +\infty$, and $\lim\limits_{x \to 3^+} f(x) = -\infty$

11) $\lim\limits_{x \to -\infty} f(x) = -1$, $\lim\limits_{x \to +\infty} f(x) = -1$,

$\lim\limits_{x \to 1^-} f(x) = +\infty$, and $\lim\limits_{x \to 1^+} f(x) = +\infty$

12) $\lim\limits_{x \to -\infty} f(x) = 3$, $\lim\limits_{x \to +\infty} f(x) = 3$, $\lim\limits_{x \to 2^-} f(x) = -\infty$, and $\lim\limits_{x \to 2^+} f(x) = +\infty$, $\lim\limits_{x \to -2^-} f(x) = +\infty$,

$\lim\limits_{x \to -2^+} f(x) = -\infty$, $f(-1) = 0$, $f(0) = 2$, and $f(1) = 0$.