1.7A Rational Functions and End Behavior

AP Precalculus Name: _____ **CA #2**

State the domain of the following rational functions. Use interval notation.

1. $f(x) = \frac{x^2-9}{x^2-x-30}$

Domain:

2. $h(x) = \frac{2x+3}{x^2+10x}$

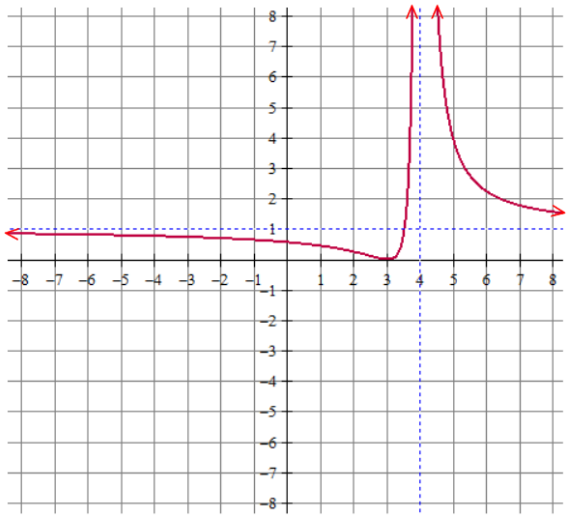
Domain:

3. $d(t) = \frac{t^2+5t-24}{5t-4}$

Domain:

Use the graph of the rational function f to find the following.

4.

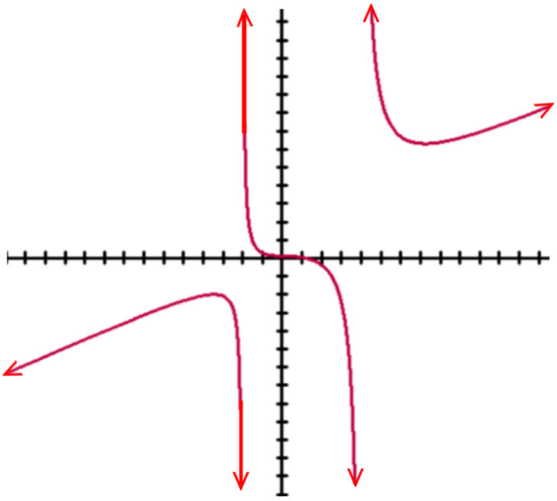


Domain:

End Behavior:

Is there horizontal aysmptote?
If so, write the equation of the horizontal aysmptote.

5.



Domain:

End Behavior:

Is there a horizontal aysmptote(s)?
If so, write the equation of the horizontal aysmptote.

Continued on the back.

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CALCULATOR ACTIVE Complete the table to answer the following.

6. $f(x) = \frac{2x+1}{x^2-3x-10}$

x	$-10{,}000$	$-1{,}000$	-100	100	$1{,}000$	$10{,}000$
$f(x)$						

End Behavior:

Is there horizontal aysmptote?
If so, write the equation of the horizontal aysmptote.

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7. $d(t) = \frac{3t^3+1}{t^3-5t^2}$

t	$-5{,}000$	-500	-50	50	500	$5{,}000$
$d(t)$						

End Behavior:

Is there horizontal aysmptote?
If so, write the equation of the horizontal aysmptote.

Answers to 1.7A CA #2

1. $(-\infty, -5) \cup (-5, 6) \cup (6, \infty)$
2. $(-\infty, -10) \cup (-10, 0) \cup (0, \infty)$
3. $\left(-\infty, \frac{4}{5}\right) \cup \left(\frac{4}{5}, \infty\right)$
4. Domain: $(-\infty, 4) \cup (4, \infty)$
   End Behavior:
   $\lim_{x\to-\infty} f(x) = 1$ and $\lim_{x\to\infty} f(x) = 1$
   Horizontal Asymptote: $y = 1$
5. Domain: $(-\infty, -2) \cup (-2, 4) \cup (4, \infty)$
   End Behavior:
   $\lim_{x\to-\infty} f(x) = -\infty$ and $\lim_{x\to\infty} f(x) = \infty$
   Horizontal Asymptote: NONE

6.

x	$f(x)$
-10,000	$\approx -2 \times 10^{-4}$
-1,000	-0.002
-100	-0.0193
100	0.0207
1,000	0.002
10,000	$\approx 2 \times 10^{-4}$

$\lim_{x\to-\infty} f(x) = 0$
$\lim_{x\to\infty} f(x) = 0$
HA: $y = 0$

7.

t	$d(t)$
-5,000	2.997
-500	2.97
-50	2.727
50	3.333
500	3.03
5,000	3.003

$\lim_{t\to-\infty} f(x) = 3$
$\lim_{t\to\infty} f(x) = 3$
HA: $y = 3$

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