Algebra 2 Name:_______________________________

Unit 8 – Day 12 – Graphing Rational Functions in (h,k) form Period:______Date:______________

<u>For each rational function, state the vertical and horizontal asymptotes.</u>

1. $y = \frac{-4}{x+3} + 5$

VA

HA

2. $y = \frac{67}{x+11} - 19$

VA

HA

3. $y = \frac{-2}{x-10}$

VA

HA

<u>For each rational function, state the domain, range, and end behavior.</u>

4. $f(x) = \frac{2}{x-7} + 8$

Domain:

Range:

End Behavior:

5. $f(x) = \frac{-1}{x+9} - 3$

Domain:

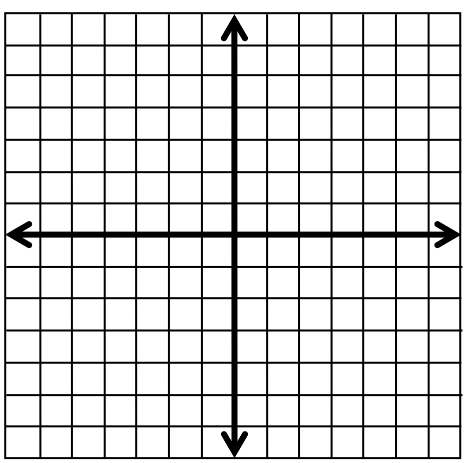
Range:

End Behavior:

<u>State the asymptotes, domain, range, and end behavior for the following rational functions and then graph them.</u>

6. $y = \frac{2}{x} + 1$

x	*y*



Vertical Asymptote:___________________________

Horizontal Asymptote:_________________________

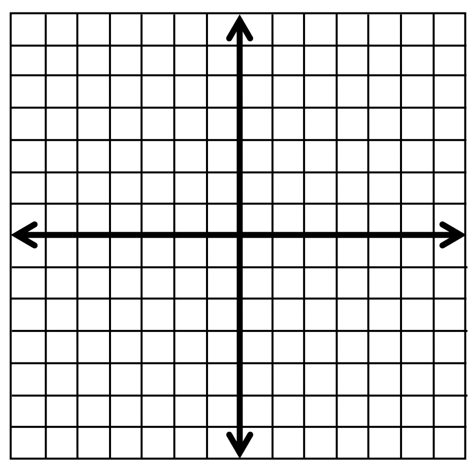
Domain: _____________

Range: _____________

End Behavior:

7. $y = \frac{-4}{x+1}$

x	*y*



Vertical Asymptote:___________________

Horizontal Asymptote:________________

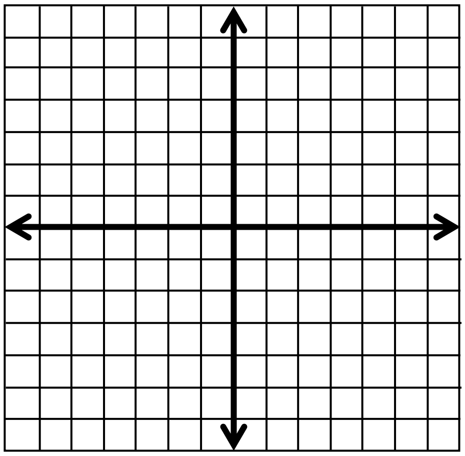
Domain: ________________

Range: ______________

End Behavior:

8. $y = \frac{3}{x-1} - 2$

x	y



Vertical Asymptote:____________________________

Horizontal Asymptote:_________________________

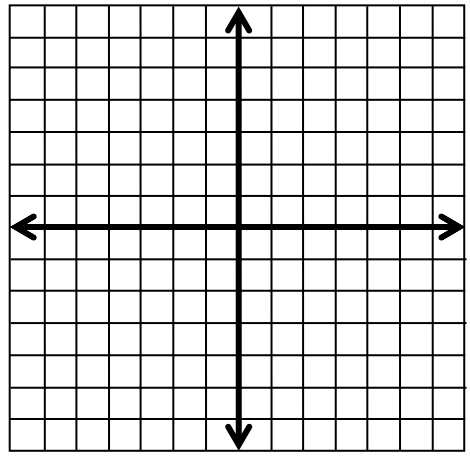
Domain: _____________

Range: _____________

End Behavior:

9. $y = \frac{-1}{x-4} - 1$

x	y



Vertical Asymptote:____________________

Horizontal Asymptote:_________________

Domain: ________________

Range: ______________

End Behavior:

10. Create a rational function with a vertical asymptote at x = 2, a horizontal asymptote at y = 4 that goes through the point (1, 2).

Algebra 2 Name:________________________

Unit 8 – Day 13 – Converting Rationals to Graphing Form Period:______Date:_____________

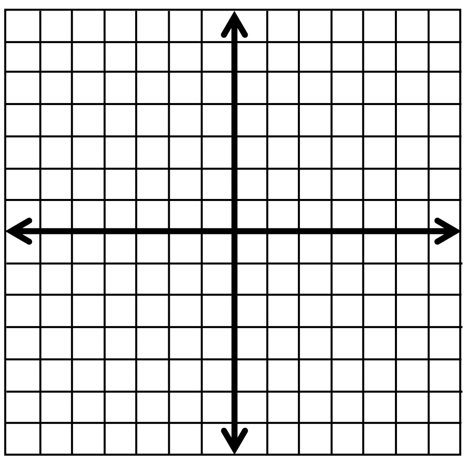
Convert the following to graphing form

1. $y = \frac{2x-2}{x+2}$ 2. $y = \frac{4x-6}{x-1}$ 3. $y = \frac{3x+20}{x+8}$ 4. $y = \frac{6+2x}{x+2}$

Graph the following functions

5. $y = \frac{x-4}{x-5}$

x	*y*



Vertical Asymptotes:_________________________

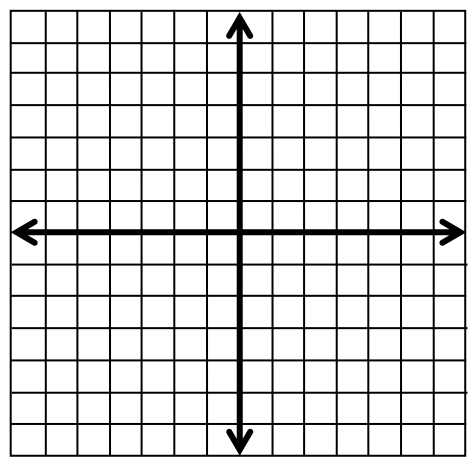
Horizontal Asymptotes:_______________________

Domain:_________________________________

Range:__________________________________

6. $y = \frac{x-3}{x+2}$

x	*y*



Vertical Asymptotes:_________________________

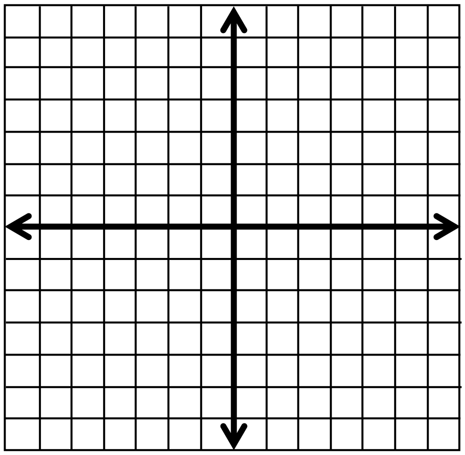
Horizontal Asymptotes:_______________________

Domain:_________________________________

Range:__________________________________

7. $y = \dfrac{-2x+7}{x}$

x	*y*



Vertical Asymptotes:______________________________

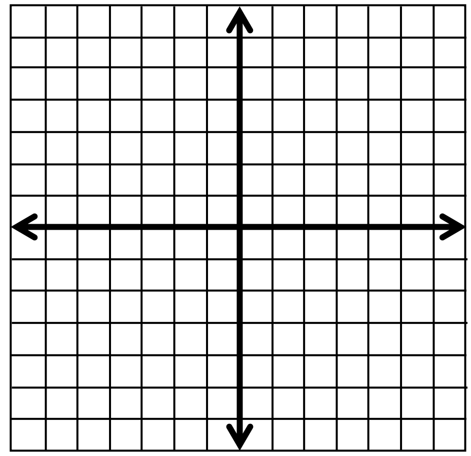
Horizontal Asymptotes:___________________________

Domain:____

Range:____

8. $y = \dfrac{-x}{x+3}$

x	*y*



Vertical Asymptotes:______________________________

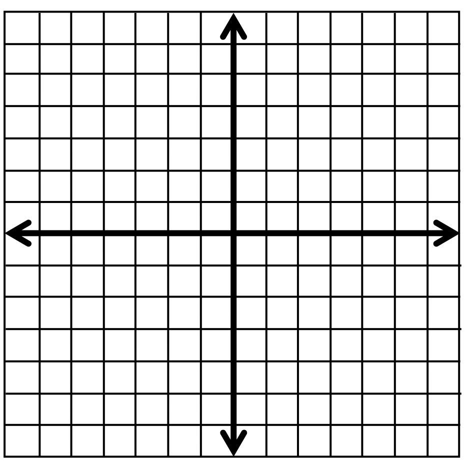
Horizontal Asymptotes:___________________________

Domain:____

Range:____

9. $y = \dfrac{4}{x}$

x	*y*



Vertical Asymptotes:______________________________

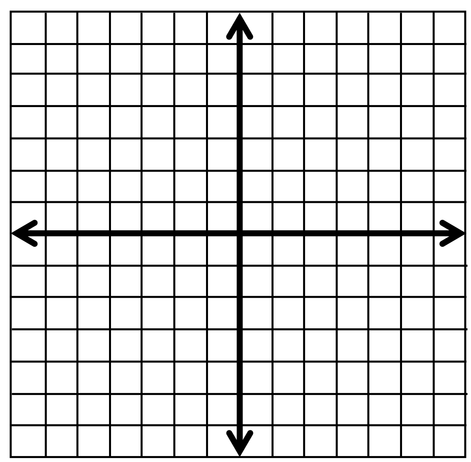
Horizontal Asymptotes:___________________________

Domain:____

Range:____

10. $y = \dfrac{x}{x-2}$

x	*y*



Vertical Asymptotes:______________________________

Horizontal Asymptotes:___________________________

Domain:____

Range:____

Algebra 2 Name:________________________________

Unit 8 – Day 14 – Graphing Rational Functions – 3 Cases Period:______Date:_____________________

State the asymptotes for each rational function.

1. $y = \frac{2x-2}{2x+2}$ 2. $y = \frac{x+1}{x^2+x-6}$ 3. $y = \frac{5x^2+1}{x^2+x-12}$

VA VA VA

HA HA HA

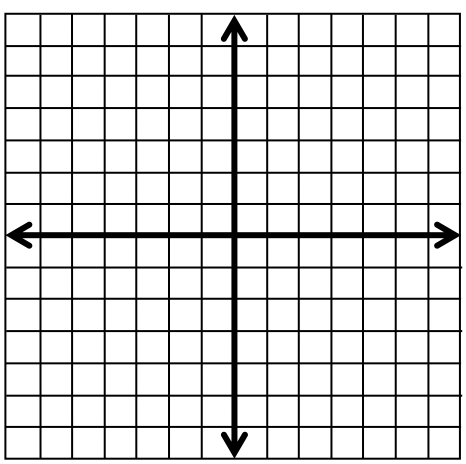
Find the *x*-values at which each rational function has a hole in its graph.

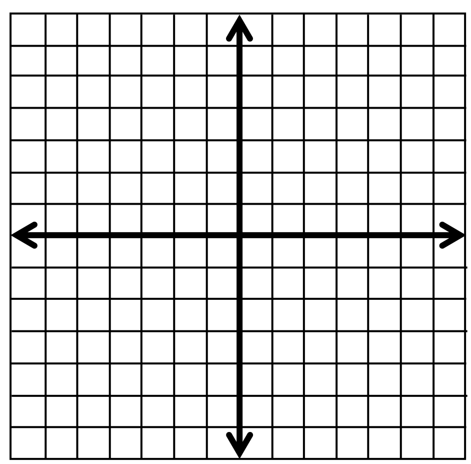
4. $y = \frac{-2x+8}{(x+4)(x-4)^2}$ 5. $y = \frac{x^2+2x}{(x^2-16)(x+2)}$ 6. $y = \frac{(x+2)^2}{x^2+5x+6}$

Graph each rational function. Rewrite the function in its graphing form. List the asymptotes.

5. $y = \frac{x-1}{x+5}$ Graphing Form:

6. $y = \frac{2x-4}{x+1}$ Graphing Form:





Vertical Asymptote:________ Vertical Asymptote:_______

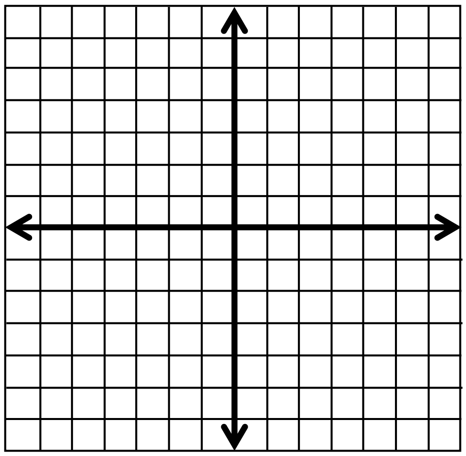
Horizontal Asymptote:_____________ Horizontal Asymptote:________

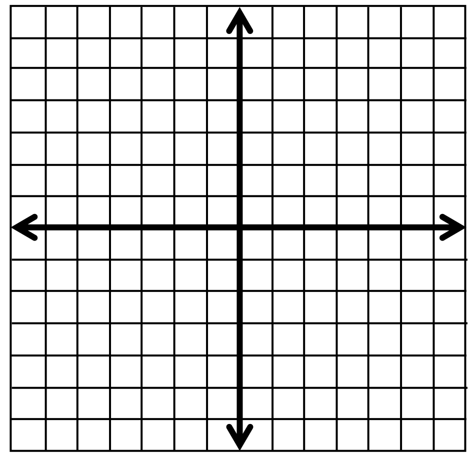
x-Intercept ________ x-intercept _______

Graph each rational function. Check for any holes.

7. $y = \frac{x^2-16}{x^2-5x+4}$

8. $y = \frac{x^2-2x+1}{x^2+x-2}$





Vertical Asymptote:____________________

Horizontal Asymptote:____________

Hole @

x-Intercept ________

Vertical Asymptote:______________

Horizontal Asymptote: ____________

Hole @

x-intercept _______

9. Which statement describes the end behavior of the function $f(x) = \frac{-3x+4}{2x+5}$?

A. as $x \to -\infty, f(x) \to +\frac{3}{2}$ and as $x \to +\infty, f(x) \to -\frac{3}{2}$

B. as $x \to -\infty, f(x) \to -\infty$ and as $x \to +\infty, f(x) \to +\frac{3}{2}$

C. as $x \to -\infty, f(x) \to -\frac{3}{2}$ and as $x \to +\infty, f(x) \to -\frac{3}{2}$

D. as $x \to -\infty, f(x) \to -\infty$ and as $x \to +\infty, f(x) \to -\frac{5}{2}$

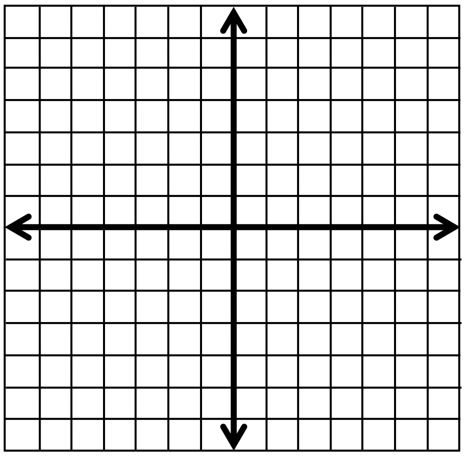
Algebra 2 Name:________________________________

Unit 8 – Day 15 – Graphing Rational Functions in any Form Period:______Date:____________________

Graph each rational function. State the domain and range. Check for any holes.

1. $f(x) = \frac{2x-1}{x-3}$

x	*y*

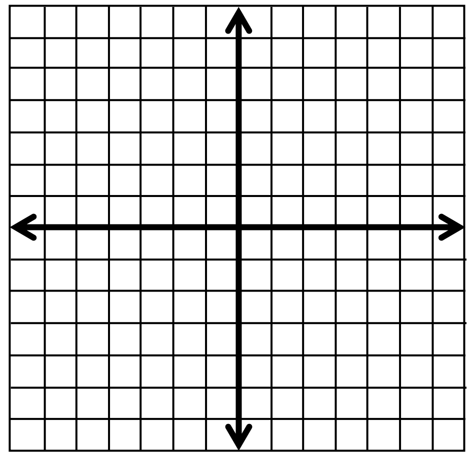


Domain:___________ x-int:__________

Range:___________________

2. $f(x) = \frac{-1}{x+4} + 2$

x	*y*

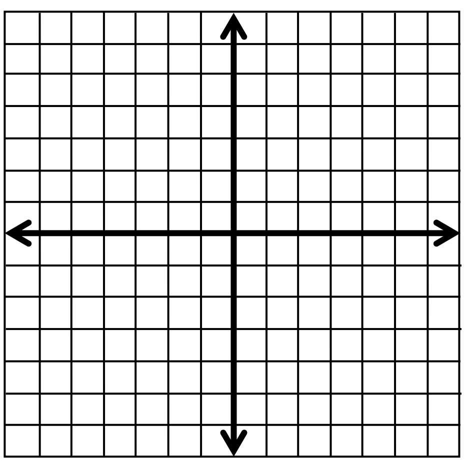


Domain:___________ x-int:___________

Range:___________________

3. $f(x) = \frac{x-3}{x^2-2x-3}$

x	*y*



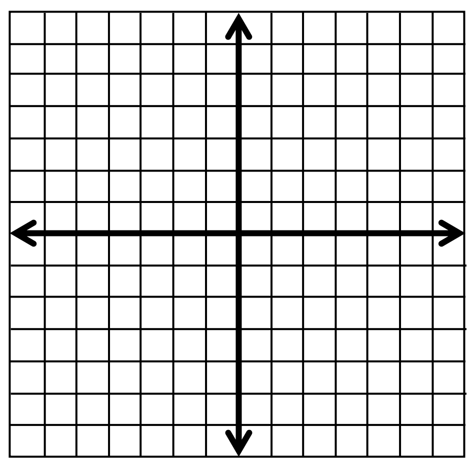
Domain:___________ x-int:__________

Range:___________________

Hole @

4. $y = \frac{x^2-9}{x^2+6x+9}$

x	*y*



Domain:___________ x-int:___________

Range:___________________

Hole @

5. Create a new rational function g(x) that moves the given function f(x) up 7 and left 8 units.

f(x) = $\frac{1}{x+3}$ – 10 g(x) =

6. Create a new rational function g(x) that moves the given function down 3 and right 4 units.

f(x) = $\frac{3x+1}{x+5}$ g(x) =

Find the Graphing Form

7. Create a new rational function g(x) that moves the given function up 1 and left 5 units.

f(x) = $\frac{2x+1}{x+4}$ g(x) =

Find the Graphing Form

8. Translate the graph of $f(x) = \frac{6x+7}{x+1}$ one unit down and four units left. Which of the following is the function after the translations?

A. $g(x) = \frac{1}{x-4} - 1$

B. $g(x) = \frac{6}{x-4} - 1$

C. $g(x) = \frac{1}{x-3} + 5$

D. $g(x) = \frac{1}{x+5} + 5$

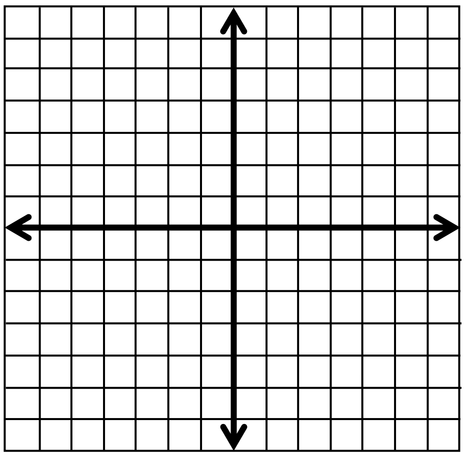
Algebra 2 Name:_________________________

Unit 8 – Day 16 – Graphing Rational Functions with All Asymptotes Types Period:______Date:________

Graph each rational function.

1. $y = \frac{2}{x^2+2}$

x	y

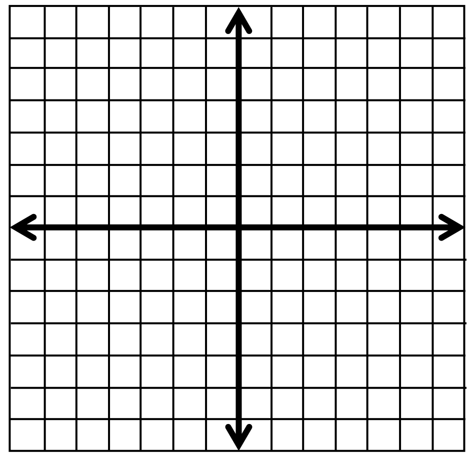


Vertical Asymptote(s):________________________________

Horizontal Asymptote:_________________________

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

x	y

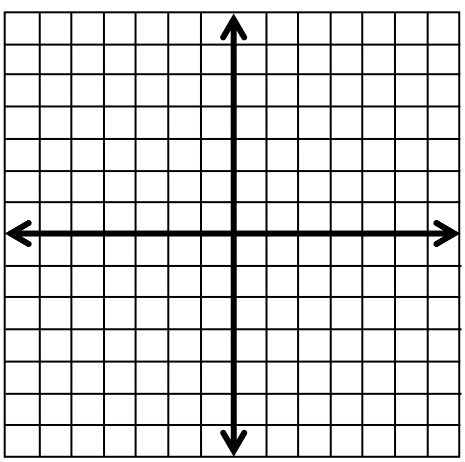


Vertical Asymptote(s):________________________

Horizontal Asymptote:________________________

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

x	y



Vertical Asymptote(s):________________________________

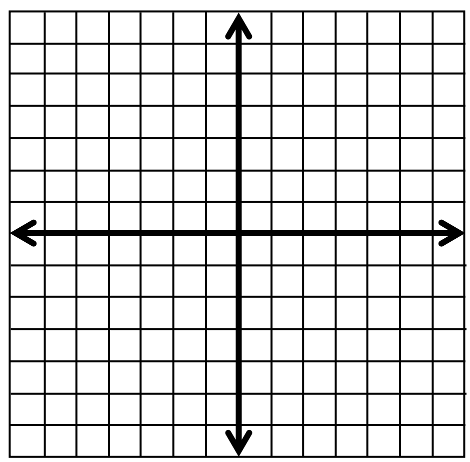
Horizontal Asymptote:_________________________

Hole(s): _____________________

x-intercept:______________________

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

x	y



Vertical Asymptote(s):________________________

Horizontal Asymptote:________________________

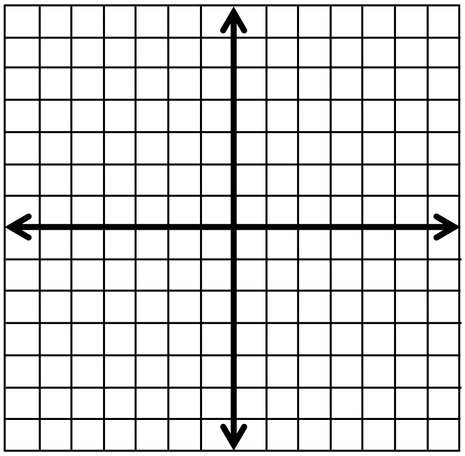
Hole(s): _____________________

x-intercept:______________________

List the vertical, horizontal, and slant asymptotes of each.

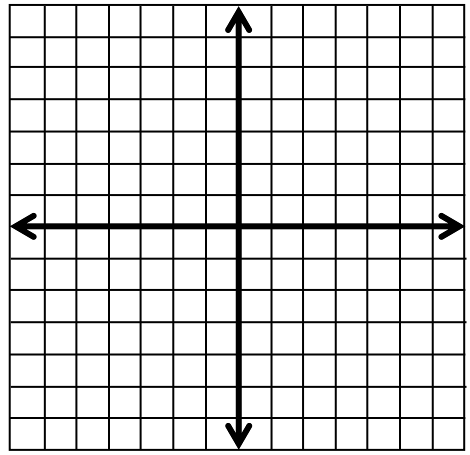
5. y = $\frac{x^2-x}{x-1}$

x	y



6. y = $\frac{x-2}{x^2-x-2}$

x	y



Vertical Asymptote:____________________________

Horizontal Asymptote:__________________________

Hole:____

x-intercepts:__________________________________

End Behavior: as $x \to -\infty,\ f(x) \to$ _____ *and* $x \to \infty,\ f(x) \to$ _____

Vertical Asymptotes:___________________

Horizontal Asymptote:________________________

Hole:_________________________________

x-intercepts:_________________________________

End Behavior: as $x \to -\infty,\ f(x) \to$ _____ *and* $x \to \infty,\ f(x) \to$ _____

7. Given $f(x) = \dfrac{3x+5}{x+1}$, what would be the equation of g(x) if f(x) is shifted 4 units right and 2 units down?

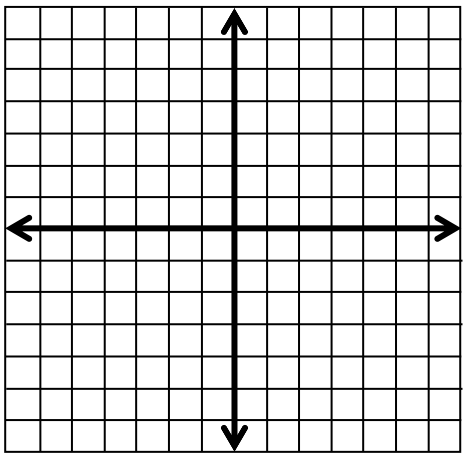
Algebra 2 Name:________________________________

Unit 8 – Day 17 – Solving Rational Functions by Graphing Period:______Date:______________

<u>Solve each rational function by graphing.</u>

1. f(x) = $\frac{-2x+5}{x-1}$ and g(x) = $x - 1$

x	*y*



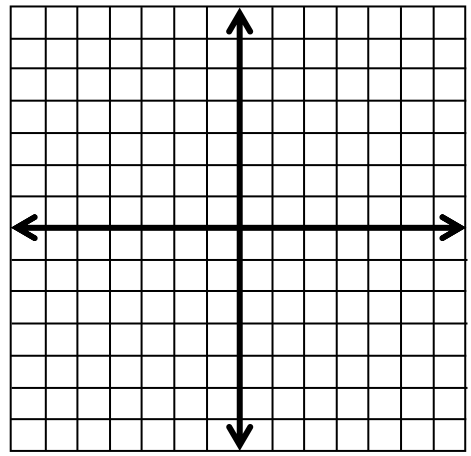
Vertical Asymptote(s):______________________________

Horizontal Asymptote:________________________

Solution(s):__________________

2. $\frac{2}{x+2} - 3 = \frac{1}{2}x - 2$

x	*y*



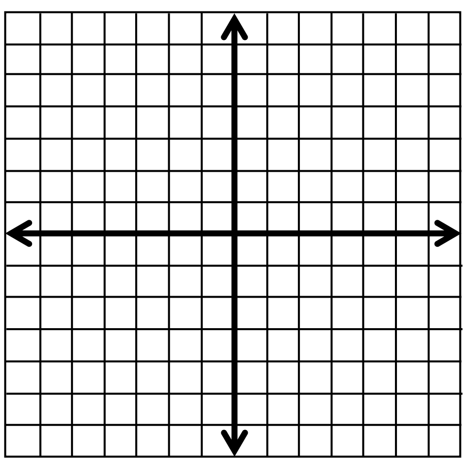
Vertical Asymptote(s):_______________________

Horizontal Asymptote:_______________________

Solution(s):_______________

3. $f(x) = \frac{x-3}{x+1}$ and $g(x) = 3$

x	*y*



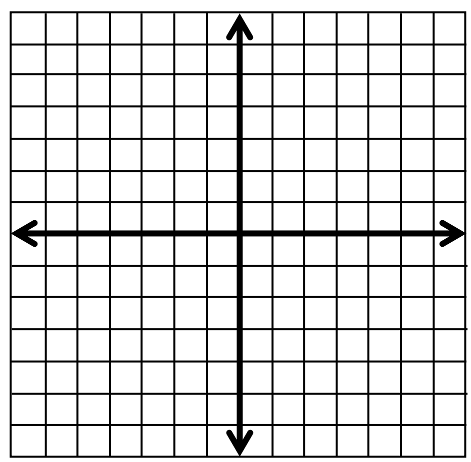
Vertical Asymptote(s):______________________________

Horizontal Asymptote:________________________

Solution(s): ____________________

4. $2x - 8 = \frac{2}{x-3} - 2$

x	*y*



Vertical Asymptote(s):_______________________

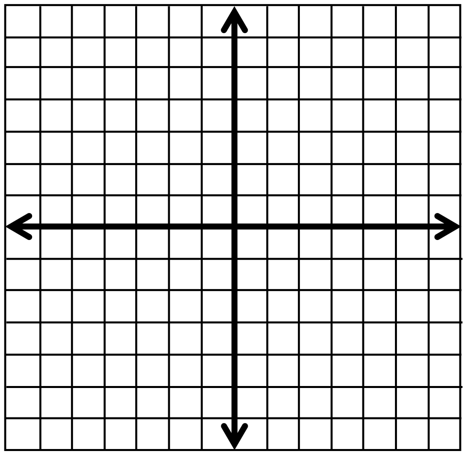
Horizontal Asymptote:_______________________

Solution(s): ____________________

List the vertical and horizontal Asymptotes, the Hole, and the solution(s).

5. $\frac{2x+2}{x^2-2x-3} = -x$

x	y



Vertical Asymptote:__________________________

Horizontal Asymptote:_________________________

Hole(s):_______________________________________

Solution(s):___________________________________

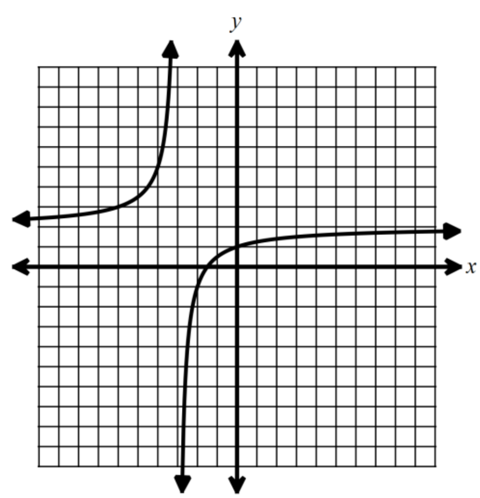
6. Let $f(x) = \frac{2x+3}{x+3}$ and $g(x) = -3x - 7$. Use the graph of $f(x)$ below to help determine the values of x for which $f(x) = g(x)$.

A. $x = -1, 5$

B. $x = -2, -4$

C. $x = -3, 2$

D. $no\ solution$

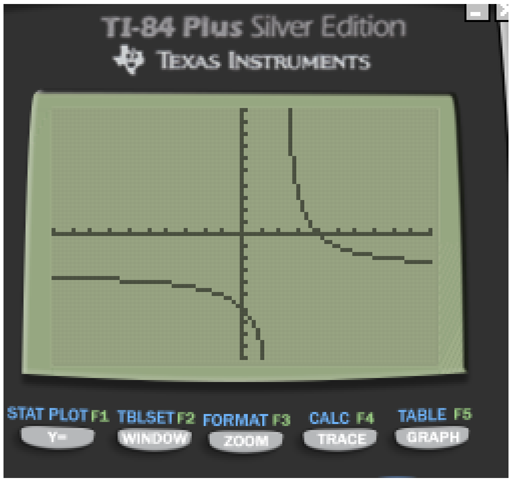


Algebra 2 – 2021 Name______________________

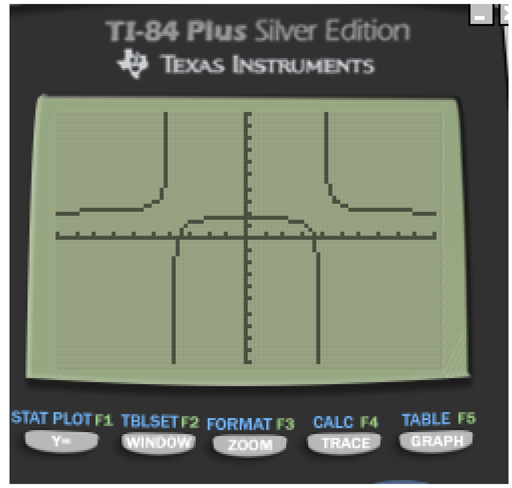
Graphing Rational Equations Review Worksheet Date______________ Period___

<u>From the calculator graphs below, draw in, and write all asymptotes.</u>

1.



2.



Horizontal: ____________________

Vertical: ____________________

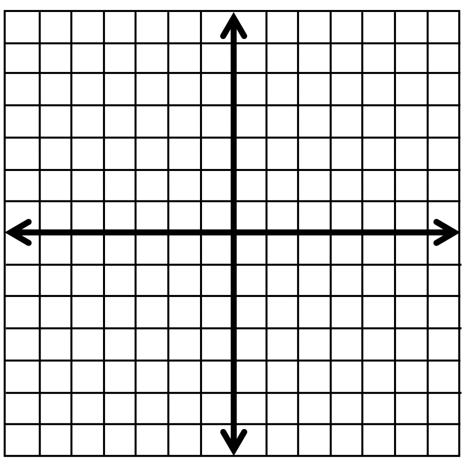
Horizontal: ____________________

Vertical: ____________________

<u>State the asymptotes, holes and x-intercepts, if present, then graph the function.</u>

3. $y = \dfrac{-2x-5}{x+1}$

x	y



Vertical Asymptotes:_________________________________

Horizontal Asymptotes:________________________

Holes:____

x-intercepts:_______________________________________

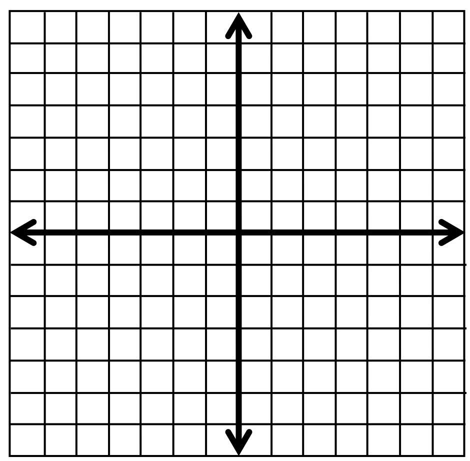
End Behavior:

$f(x) \to$ ______ $as\ x \to -\infty\ and$

$f(x) \to$ ______ $as\ x \to \infty$

4. $y = \dfrac{3}{x^2+x-6}$

x	y



Vertical Asymptotes:________________________

Horizontal Asymptotes:_______________________

Holes:_____________________________________

x-intercepts:______________________________________

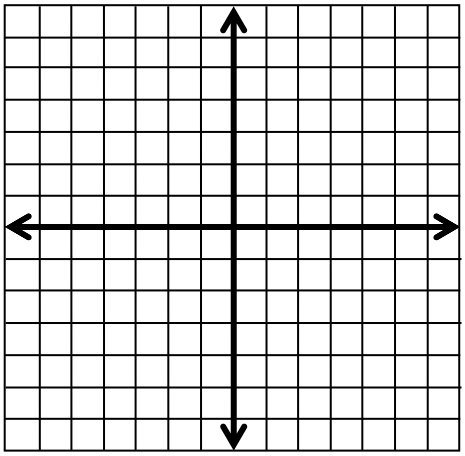
End Behavior:

$f(x) \to$ ______ $as\ x \to -\infty\ and$

$f(x) \to$ ______ $as\ x \to \infty$

5. $y=\dfrac{x^2+x}{x^2-1}$

x	y



Vertical Asymptotes:____________________________________

Horizontal Asymptotes:__________________________

Holes:____

x-intercepts:____

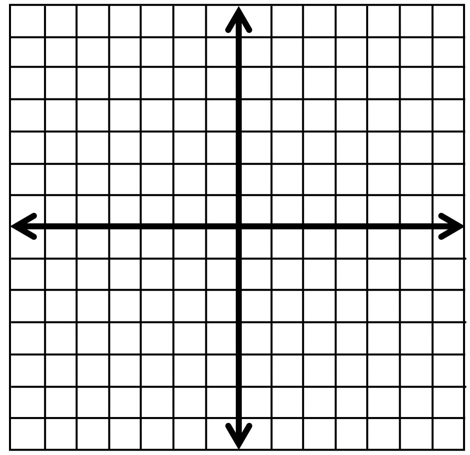
End Behavior:

$f(x)\rightarrow$ _______ $as\ \ x\rightarrow-\infty\ \ and$

$f(x)\rightarrow$ _______ $as\ \ x\rightarrow\infty$

6. Solve by graphing: $x+2=\dfrac{x+2}{x+3}$

x	y	y



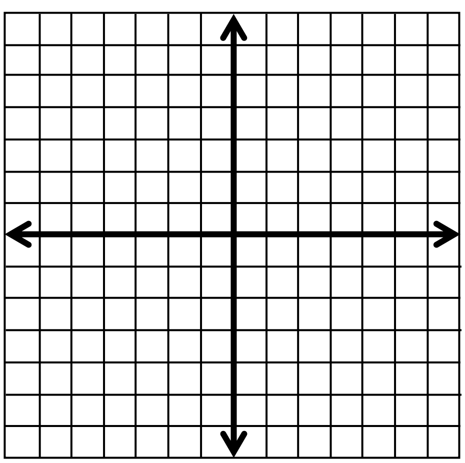
Vertical Asymptotes:___________________________

Horizontal Asymptotes:_________________________

Answer:____

7. $y=\dfrac{4}{x-2}+1$

x	y



Domain:_________________

Range:________________

End Behavior:

$f(x)\rightarrow$ _______ $as\ \ x\rightarrow-\infty\ \ and$

$f(x)\rightarrow$ _______ $as\ \ x\rightarrow\infty$

Vertical Asymptotes:____________________________________

Horizontal Asymptotes:__________________________

Holes:____

x-intercepts:____

8. Create a new rational function g(x) that moves the given function f(x) up 6 and left 7 units.

f(x) = $\frac{1}{x-4}$ – 10 g(x) =

9. Create a new rational function g(x) that moves the given function down 2 and right 5 units.

f(x) = $\frac{4x-3}{x-2}$ g(x) =

10. Translate the graph of $f(x) = \frac{1}{x}$ two units up and one unit right. Which of the following is the function after the translations?

A. $f(x) = \dfrac{1}{x+1} + 2$

B. $f(x) = \dfrac{2x-1}{x-1}$

C. $f(x) = \dfrac{1}{x+2} + 1$

D. $f(x) = \dfrac{2}{x-1}$

11. Identify the asymptotes, domain and range of the function $f(x) = \frac{2}{x-2} - 8$.

A. Asymptotes: $x = 2, y = -8$
$D: \{x | x \neq 2\}$
$R: \{y | y \neq -8\}$

B. Asymptotes: None
$D: \{all\ real\ numbers\}$
$R: \{all\ real\ numbers\}$

C. Asymptotes: $x = 0, y = -1$
$D: \{x | x \neq 0\}$
$R: \{y | y \neq -1\}$

D. Asymptotes: $x = 2, y = -1$
$D: \{x | x \neq 2\}$
$R: \{y | y \neq -1\}$

12. Which of the following is an equivalent form of $f(x) = \frac{2x+3}{x-3}$?

A. $f(x) = \dfrac{2}{x-3} + 3$

B. $f(x) = \dfrac{2}{x-3} + 9$

C. $f(x) = \dfrac{3}{x-3} + 9$

D. $f(x) = \dfrac{9}{x-3} + 2$

13. Which statement describes the end behavior of the function $f(x) = \dfrac{3x+4}{x-5}$?

A. as $x \to -\infty, f(x) \to +5$ and as $x \to +\infty, f(x) \to +5$

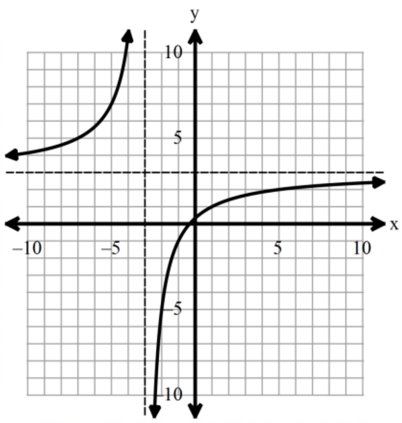
B. as $x \to -\infty, f(x) \to -\infty$ and as $x \to +\infty, f(x) \to +3$

C. as $x \to -\infty, f(x) \to +3$ and as $x \to +\infty, f(x) \to +3$

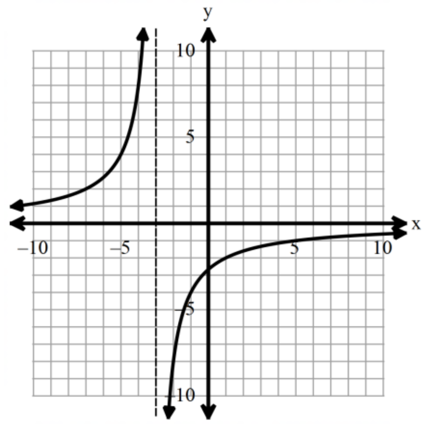
D. as $x \to -\infty, f(x) \to +3$ and as $x \to +\infty, f(x) \to +5$

14. Which is a graph of $f(x) = \dfrac{3x+1}{x+3}$ with any vertical or horizontal asymptotes indicated by dashed lines?

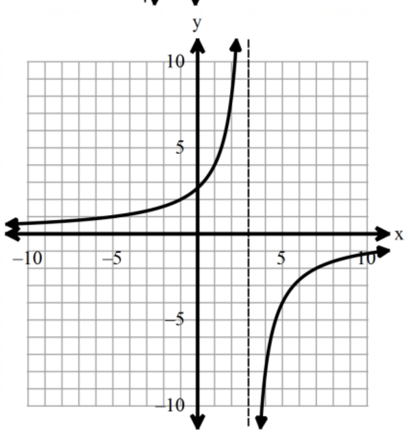
A.



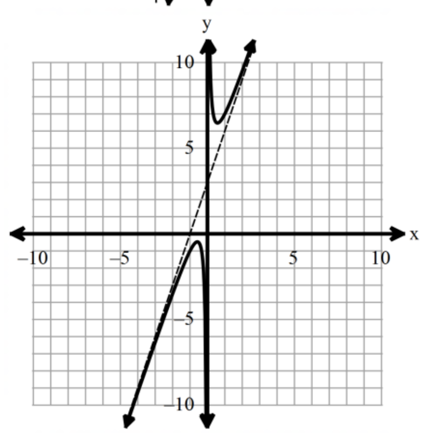
C.



B.



D.



15. Which of the follow is the equation for the function to the right?

A. $y = \dfrac{x}{x-2} + 1$

B. $y = \dfrac{3}{x+2} + 1$

C. $y = \dfrac{x^2+2x}{x^2-4}$

D. $y = \dfrac{x+2}{x^2-4}$