HW40: Rational Function Graphs Worksheet Name: key

State the ALL asymptotes of the following rational functions.

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

VA: $x=1$

SA: $y=2x+2$

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

VA: $x=-1$

HA: $y=-2$

3) $h(x)=\frac{x+2}{x^2-1}$

VA: $x=-1, 1$

HA: $y=0$

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

VA: $x=3, -1$

HA: $y=2$

5) $g(x)=-\frac{3}{x+2}+3$

VA: $x=-2$

HA: $y=3$

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

VA: $x=-1$

SA: $y=x+2$

State the domain of the following functions.

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

$(-\infty,1)\cup(1,\infty)$

8) $g(x)=\frac{3x}{x^2-2x+1}$

$(-\infty,1)\cup(1,\infty)$

9) $h(x)=\frac{x^2+3x-4}{x+3}$

$(-\infty,-3)\cup(-3,\infty)$

State the transformation of the following functions.

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

① right 1

11) $g(x)=\frac{3}{x+2}-2$

① Left 2

② Down 2

12) $h(x)=-\frac{4}{x}+5$

① Reflect over the y-axis

② up 5

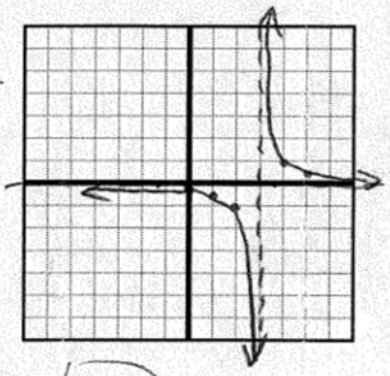
Sketch the graph.

13) $g(x)=\dfrac{1}{x-3}$

$y=\frac{1}{x}$

x	y
-2	$-1/2$
-1	-1
0	und.
1	1
2	$1/2$

$x+3$	y
1	$-1/2$
2	-1
3	und.
4	1
5	$1/2$



VA: $x=3$ **HA:** $y=0$

***x*-intercept:** none

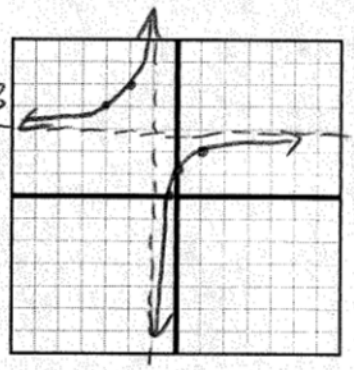
***y*-intercept:** $-\frac{1}{3}$

14) $g(x)=-\dfrac{2}{x+1}+3$

$y=\frac{2}{x}$

x	y
-2	-1
-1	-2
0	und.
1	2
2	1

$x-1$	$-y+3$
-3	4
-2	5
-1	und.
0	1
1	2



VA: $x=-1$ **HA:** $y=3$

***x*-intercept:** $0=-\frac{2}{x+1}+3$

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

$-3(x+1)=-2$

$-3x-3=-2$

$-3x=1$

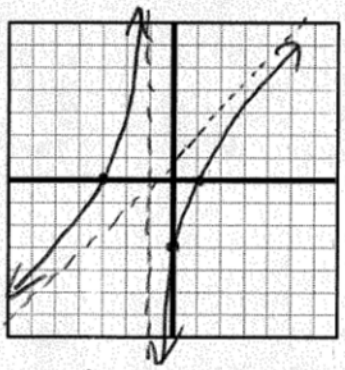
$x=-\frac{1}{3}$

***y*-intercept:** $g(0)=-\frac{2}{0+1}+3$

$-2+3$

$y=1$

15) $g(x)=\dfrac{x^2+2x-3}{x+1}=\dfrac{(x+3)(x-1)}{x+1}$



***y*-intercept:** $g(0)=\frac{3(-1)}{1}=-3$

***x*-intercept:** $(x+3)(x-1)=0$

$x=-3,1$

VA: $x=-1$ **SA:**

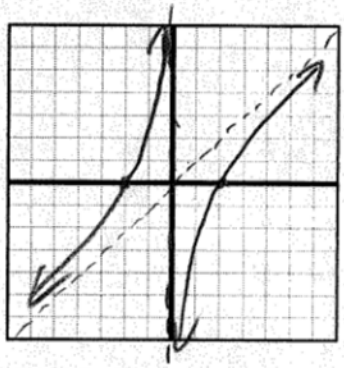
-1 | 1 2 -3

-1 -1

1 1 $\not{0}$

$y=x+1$

16) $g(x)=\dfrac{x^2-4}{x}=\dfrac{(x+2)(x-2)}{x}$



***y*-intercept:** $g(0)=\frac{2(-2)}{0}=$ und.

none

***x*-intercept:** $(x+2)(x-2)=0$

$x=-2,2$

VA: $x=0$ **SA:**

0 | 1 0 -4

0 0

1 0 $\not{0}$

$y=x$