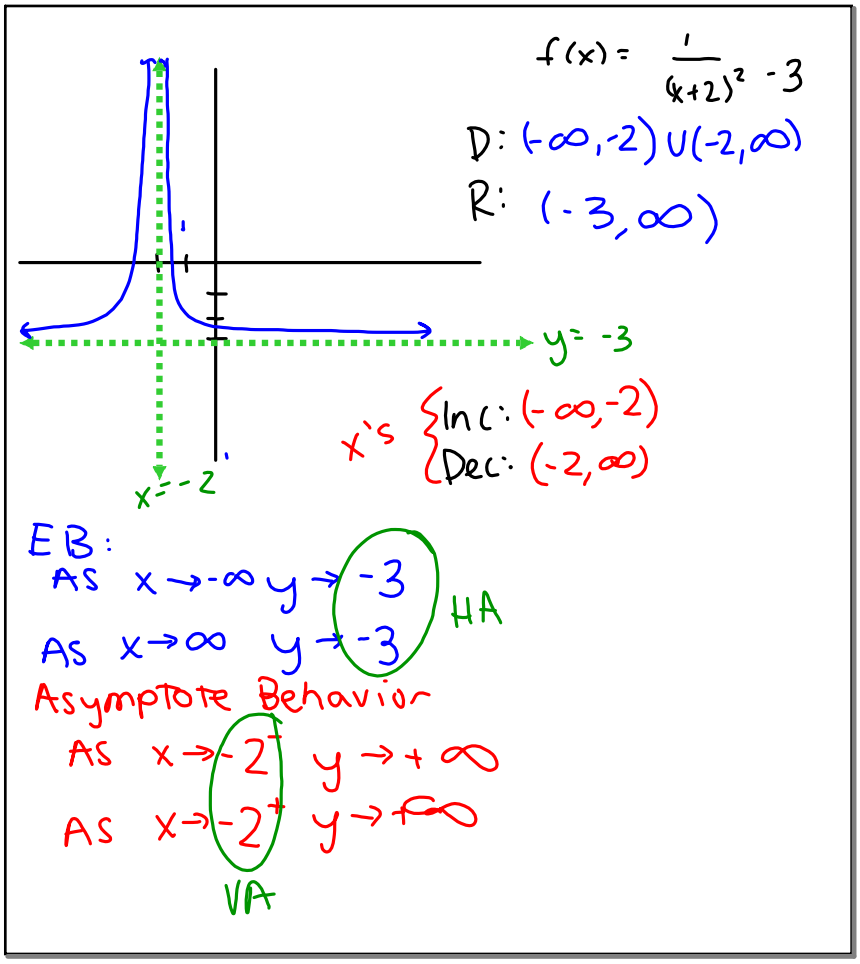
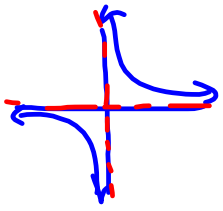


5-2 Graphing Transformation Form

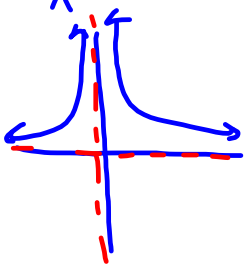
I can graph the transformation form of a rational expression.

Parent functions:

$\frac{1}{x}$



$\frac{1}{x^2}$



Transformation form:

$-a\frac{1}{x-h}+k$

- $-$: Flip
- a : V. stretch
- h : H. Shift
- k : V. Shift

When given a rational function in the form of $f(x)=\frac{mx+n}{px+q}$ where $m\neq 0$ and $p\neq 0$, you can use division to re-write the function in a form to identify the transformations.

$g(x)=\frac{3x-4}{x-1}$ → $\frac{a}{x-h}+k$ (transformation form)

$(3x-4)\div(x-1)=3+\frac{-1}{x-1}=-\frac{1}{x-1}+3$

$+1$ | $3x$ -4

$+$ ↓ 3

3 | -1 R

$(x^2+6x+12)\div(x-2)=x+8+\frac{28}{x-2}$

$+2$ | $1x^2$ 6 12

$+$ ↓ 2 16

$1x+8$ | 28 R

Given $f(x)=\frac{2x-1}{x+3}$, use division to re-write the function and identify the transformations.

$(2x-1)\div(x+3)=2+\frac{-7}{x+3}$

-3 | 2 -1

$+$ ↓ -6

2 | -7

R

$-\frac{7\cdot 1}{(x+3)}+2$

Transformations:

- V. Flip
- Shift Left 3
- Shift Up 2
- Stretch 7

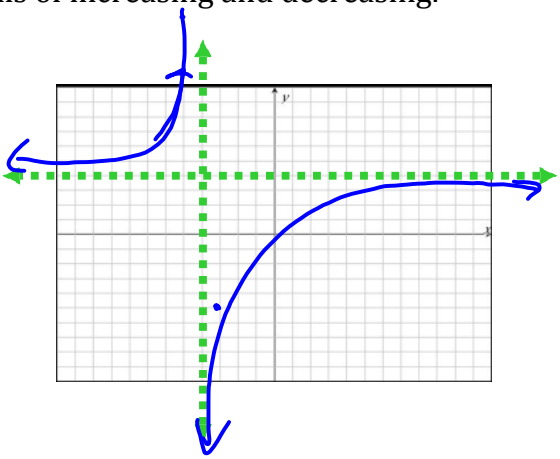
Given $f(x)=\dfrac{4x+7}{x+4}$, use division to re-write the function and identify the transformations. Then sketch a graph and state the domain, range, and intervals of increasing and decreasing.

$-4\,|\,4 \quad 7$

$+\downarrow \quad -16$

$4 \quad -9$ R

$f(x)=-\dfrac{9}{(x+4)}+4$



Transformations

- V. Flip
- V. Stretch 9
- Shift Left 4
- Shift Up 4

Given $f(x)=\dfrac{3x+7}{x+2}$, use division to re-write the function and identify the transformations. Then sketch a graph and analyze.

$f(x)=\dfrac{1}{x+2}+3$

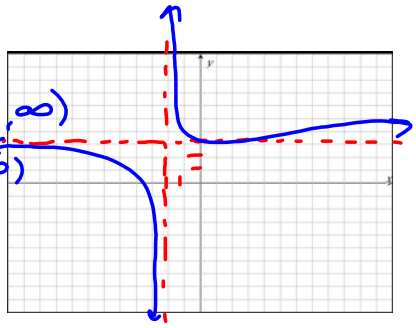
Domain: $(-\infty,-2)\cup(-2,\infty)$

Range: $(-\infty,+3)\cup(3,\infty)$

V Asymptote: $x=3$

H Asymptote: $y=-2$

End Behavior:



Asymptote behavior:

$-2\,|\,3 \quad 7$

$+\downarrow \quad -6$

$3 \quad 1$

$$f(x)=\frac{5-2x}{x+4}$$

Domain:

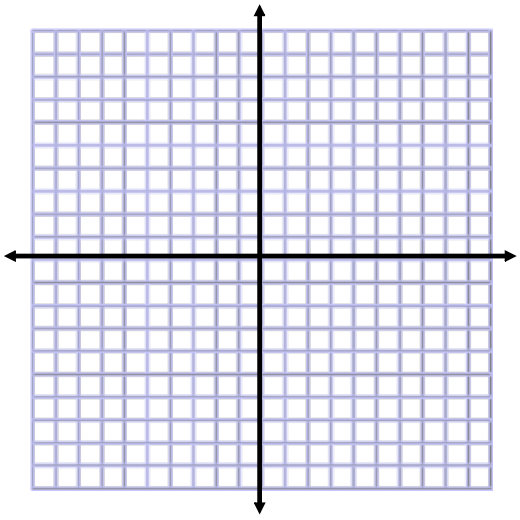
Range:

V Asymptote:

H Asymptote:

End Behavior:

Asymptote behavior:



$$f(x)=\frac{4-3x}{x-5}$$

Domain:

Range:

V Asymptote:

H Asymptote:

End Behavior:

Asymptote behavior: