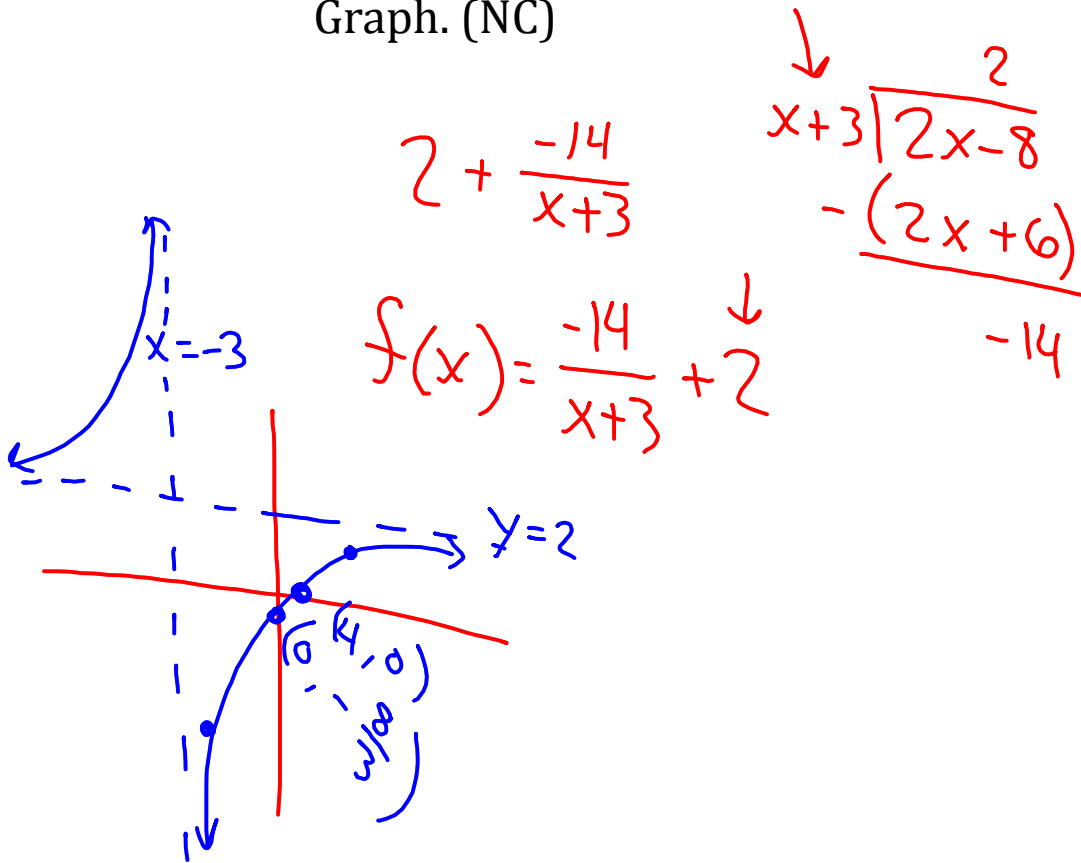HAT
Graphing Rational Functions

1/18/18

Warm Up: Use long division to rewrite $f(x) = \dfrac{2x-8}{x+3}$ $\dfrac{-8}{3}$

This form emphasizes the horizontal asymptote. Graph. (NC)

$$2 + \dfrac{-14}{x+3}$$

$$x+3\overline{\smash{\big)}\,2x-8}$$
$$\underline{-(2x+6)}$$
$$-14$$

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

$x=-3$

$y=2$

$(0, \tfrac{4}{3}, 0)$

$(0, -\tfrac{8}{3})$

Go Grab a Chromebook and go to Desmos.com
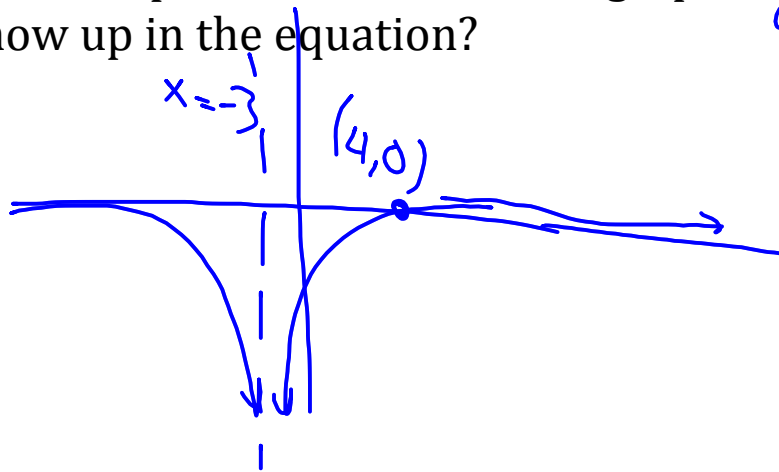
We are going to be looking at some graphs today!

desmos

Ex#1: Use ~~your calculator~~ to graph $f(x) = \dfrac{2x-8}{(x+3)^{2}}$.

$(x+3)\overline{)2x-8}$

Note the similarities/differences between this graph and the one in the WarmUp.

same direction as we approach the asymptote

How do specific features of the graph show up in the equation?

$x=-3$

$(4,0)$

Ex#2: On desmos, graph $f(x) = \dfrac{2x - 8}{(x + 3)(x - 6)}$

How does this graph compare to the others?

$x = -3$, How do specific features of the graph
show up in the equation? $x = 6$?

2 vert. Asymp.
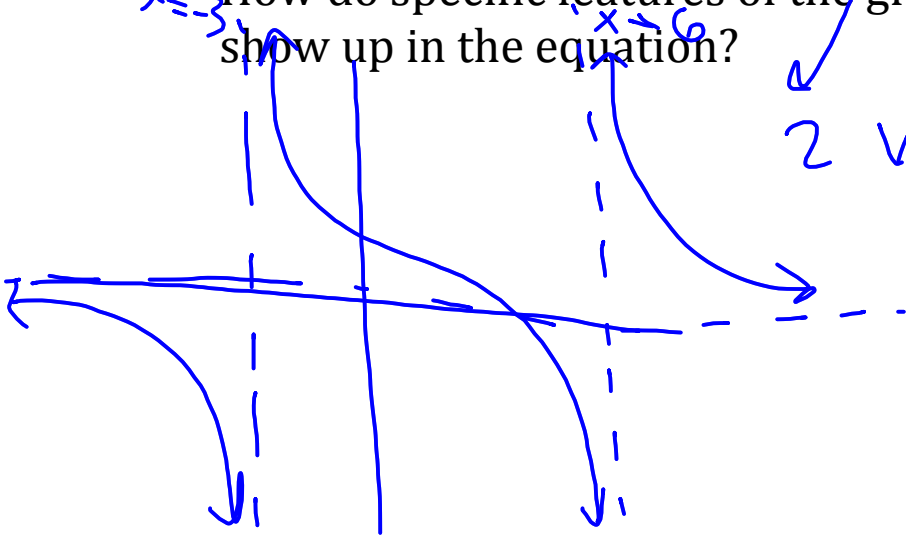
Ex#3: On desmos, graph $f(x) = \dfrac{(x-4)(x+5)}{(x+3)(x-6)}$

How does this graph compare to the others?

How do specific features of the graph
show up in the equation?

Ex#4: On desmos, graph $f(x) = \dfrac{(x-4)(x+5)}{(x+3)^2(x-6)}$

How does this graph compare to the others?

How do specific features of the graph show up in the equation?

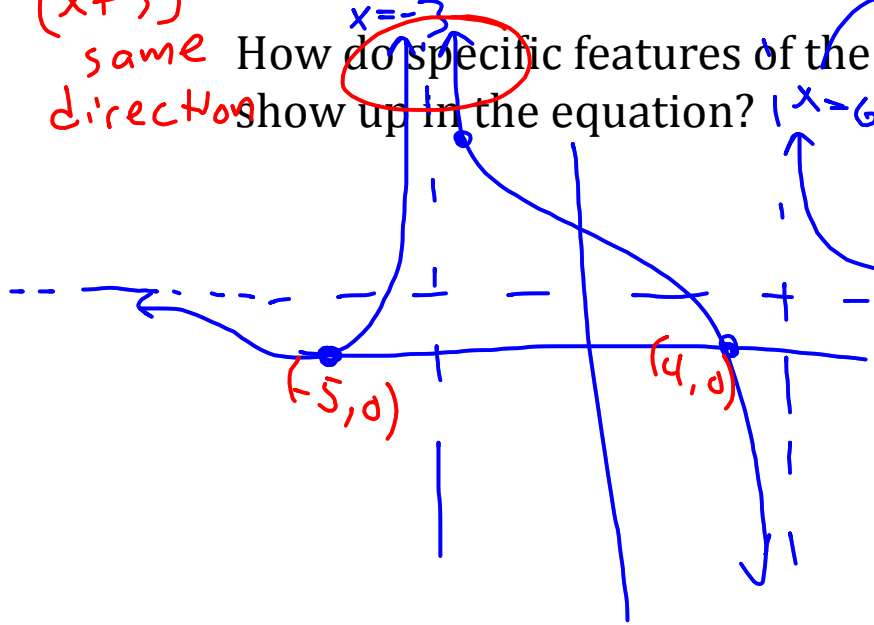$$\frac{+6 \cdot 9}{1 \cdot +8} \qquad \frac{54}{8}$$

Ex#5: On desmos, graph $\qquad f(x) = \dfrac{(x-4)(x+5)^2}{(x+3)^2(x-6)}$

$(x+3)^{\textcircled{2}}$ How does this graph compare to the others?

$x=-3$

same How do specific features of the graph

direction show up in the equation? $x=6$

$x=1$

same degrees

no coefficients

$(-5,0)$

$(4,0)$

Assignment: (NC) page 558 #14, 15, 16, 18, 38, 39, 45