Name: _____   Date: _____

| Learning Goal 0.1 | Expectations for graphing from previous years. |

Example Consider the function $y = x(x-1)^2(x+3)$.

a. What kind of function is this?

degree 4
polynomial

b. Find the $x -$ intercept(s).

$y = 0$

$x = 0$ multiplicity 1
$x = 1$ multiplicity 2
$x = -3$ multiplicity 1

c. Find the $y -$ intercept.

$x = 0$

$y = (0)(-1)^2(3)$
$= 0$

d. Determine the domain and range.

$\{x \mid x \in \mathbb{R}\}$

- NOt ENOUGH INFO FOR
the minimum OR
local MaxiMUM
value ... yet!

e. Sketch the function.

$x = 0$ /

$x = 1$ ∪

$x = -3$ \

Example Consider the function $y = (1/2)^x$

a. What kind of function is this?

exponential

b. Find the $x -$ intercept(s).

$y = 0$

$(\frac{1}{2})^x = 0$

NOt POSSIBLE - HA

c. Find the $y -$ intercept.

$x = 0$

$y = (\frac{1}{2})^0$
$= 1$

d. Determine the domain and range.

$\{x \mid x \in \mathbb{R}\}$

$\{y \mid y > 0, y \in \mathbb{R}\}$

STRICT iNEQUALity!

e. Sketch the function.

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

$(\frac{1}{2})^{-2} = 2^{-(-2)}$
$= 4$

Assignment   Handout   Quiz Next Day!

Example Consider the function $y = \dfrac{2x}{x-3}$

a. What kind of function is this?

Rational.

b. Find the x – intercept(s). $y = 0$

$(x-3) \times 0 = \dfrac{2x}{x-3} \times (x-3)$

$0 = 2x$

$x = 0$

c. Find the y – intercept. $x = 0$

$y = 0$

d. Determine the domain and range.

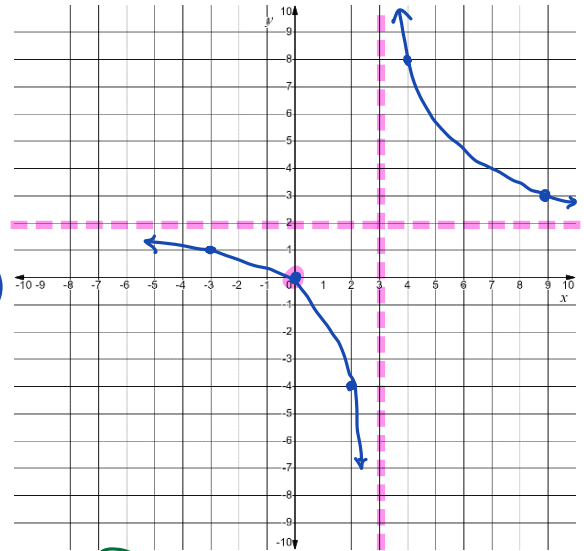✳ need to fiND tHe asyMptotes FiRst

e. Sketch the function.

$y = 2\left(\dfrac{x-3+3}{x-3}\right)$

$= 2\left(\dfrac{x-3}{x-3} + \dfrac{3}{x-3}\right)$

$= 2\left(\dfrac{3}{x-3} + 1\right)$

$= \dfrac{6}{x-3} + 2$

① HS/VS BaFO 6   ② VT 2↑   ③ HT 3→

Example Suppose a cost – benefit model is given by the following equation, where y is the cost in thousands of dollars of removing x percent of a given pollutant.

$$y = \dfrac{6.7x}{100 - x}$$

a. What type of function is this?

Rational

b. Find the cost of removing 50% of the pollutant and 80% of the pollutant.

$x = 50$

$f(50) = \dfrac{6.7(50)}{100-50}$

$= 6.7$

$\$6\,700$

$x = 80$

$f(80) = \dfrac{6.7(80)}{100-80}$

$= 26.8$

$\$26\,800$

c. Is it possible to remove **all** of the pollutant? Explain.

$x = 100$

THiS WOULD MaKe tHe DeNOMiNatoR zeRo, so it's NOt POSSiBLe.

Assignment   Handout   Quiz Next Day!