3.3 Notes

Wednesday, June 19, 2019 1:20 PM

Domain - set of all x-values for which a function is defined

Range - set of all y-values for which a function is defined

- Define Domain Algebraically

Case 1: Polynomial

$f(x) = 4x^3 - x^2 + 5x - 1$

D: All Real #'s or $\mathbb{R}$

or $(-\infty, \infty)$

Case 2: Fraction

$f(x) = \frac{2x-6}{x+10}$

$x+10=0$

$x=-10$

Set denominator equal to zero

D: $\mathbb{R}$ except $x=-10$

or $(-\infty, -10)(-10, \infty)$

-10 excluded

Case 3: Square Root

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

$x=-10$ $\sqrt{-91}$

$x=-2$ $\sqrt{5}$ ✓

$x=0$ $\sqrt{9}$ ✓

$x=1$ $\sqrt{8}$ ✓

$x=4$ $\sqrt{-7}$

① set inside √ equal to zero

$9-x^2=0$

$\pm\sqrt{9} = \sqrt{x^2}$

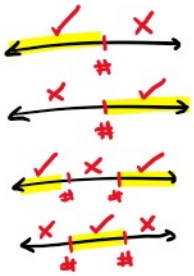
$\pm 3 = x$

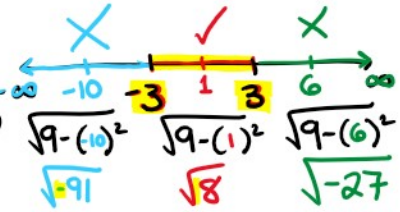
$\sqrt{9-(\pm 3)^2} \Rightarrow \sqrt{0} = 0$

② Plot #'s on number line

③ Pick a # in each region

④ Plug in #'s to f(x)





⑤ Define Domain using Interval Notation

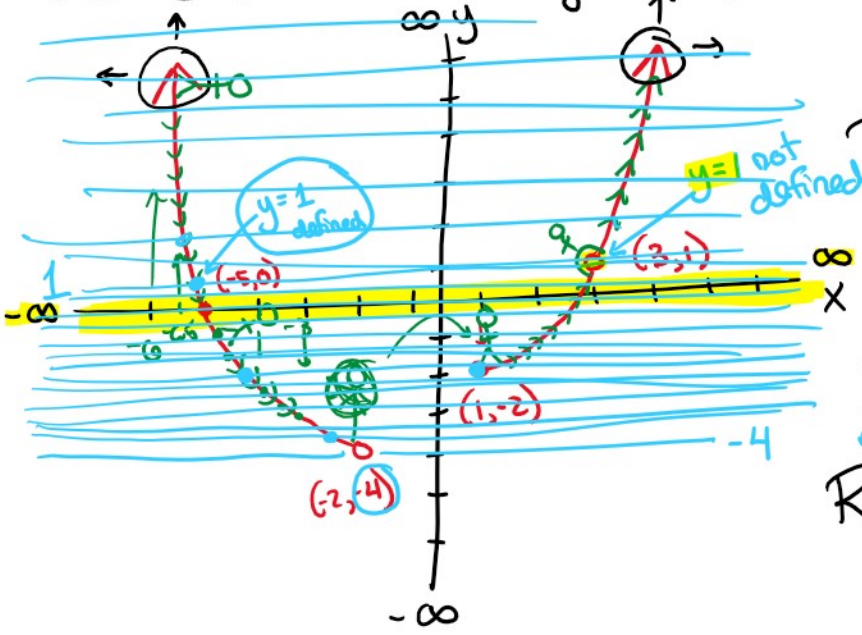
D: $[-3, 3]$

MIDDLE

$(-\infty, -3]$ LEFT

$[3, \infty)$ RIGHT

- Define Domain and Range Graphically



Read graph from left to right

Domain (set of x-values)

not included included

D: $(-\infty, -2)\ [1, 3)\ (3, \infty)$

left-most part of graph

hole at -2

next x-value

hole

Read graph bottom to top

Range (set of y-values)

not included

R: $(-4, \infty)$

lowest y-value

$-\infty$

lowest y-value

only stop if graph is not defined at all for a specific y-value