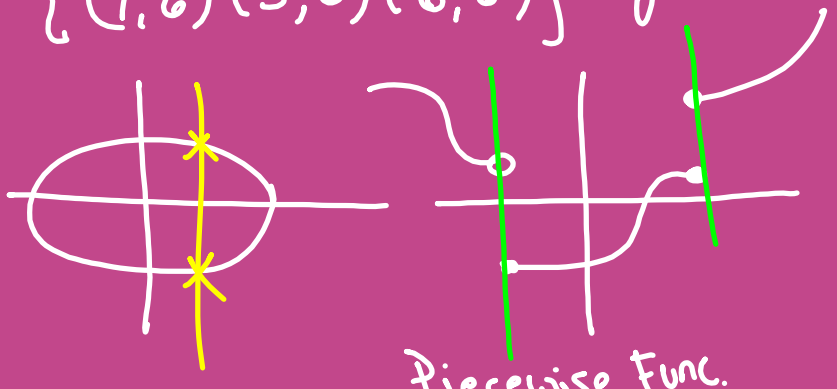
August 19, 2024

FUNCTIONS - Each x-coord. is paired with exactly one y-coord.

$\{(-2,3)\ (4,-6)\ (5,-2)\ (8,-3)\ (4,6)\}$ No

$\{(4,6)(5,6)(6,6)\}$ yes



No

Piecewise Func.

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Is this a function?

$y = 3x^3 + 2$ yes

1 | 5

$y = \pm\sqrt{x}$ No

4 | ±2

Not a func

$y = \pm$

y to an even power

$|y|$

$6x + y^2 = 1$

$\sqrt{y^2} = \sqrt{1 - 6x}$

$y = \pm\sqrt{1-6x}$ No

$(x)^2 = (\sqrt{y})^2$

$x^2 = y$

$|y| = 2x + 3$

$|y| = 2(1) + 3$

$|y| = 5$

$y = -5$ or $y = 5$

$$f(x) = 3x^2 - 7x + 9$$

$$f(-2) = 3(-2)^2 - 7(-2) + 9$$

$$= 12 + 14 + 9$$

$$= 35$$

$$f(x) = \begin{cases} x^2 - 4 & x < 1 \\ 3 & 1 \le x \le 5 \\ \frac{2}{x+1} & x > 5 \end{cases}$$

$$f(7) = \frac{2}{7+1} = \frac{2}{8} = \frac{1}{4}$$

$$f(2) = 3$$

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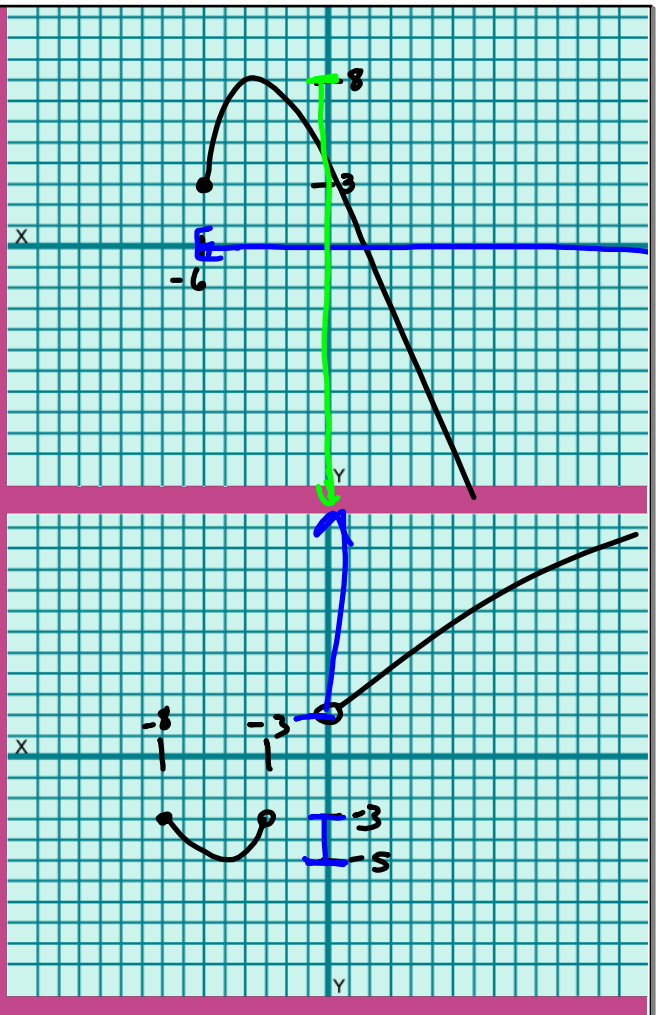
Domain – set of x-coords
L to R $[-6, \infty)$

Range – set of y-coords.
Low to High $(-\infty, 8]$

Domain:
$[-8, -3) \cup (0, \infty)$

Range:
$[-5, -3] \cup (2, \infty)$



Type of Function	Domain Restrictions	Method to Solve
Polynomials $y = 3x^2 + 4x - 2$ $y = 5x^8 - 7x^5 + 2x^3 - 11$	None	$(-\infty, \infty)$ OR $\mathbb{R}$
Rational Func. $f(x) = \frac{x+7}{x^2-2x-3}$ $\frac{7}{0}$	Denom $\neq 0$	Set denom $= 0$, factor & solve. $x \neq 3, -1$ $x^2 - 2x - 3 = 0$ $(x-3)(x+1) = 0$ $x = 3 \quad x = -1$
odd Root $f(x) = \sqrt[3]{x-2}$	$\sqrt[3]{8} = 2$ $\sqrt[3]{-8} = -2$ None	$(-\infty, \infty)$ OR $\mathbb{R}$
Even Root $f(x) = \sqrt{x+7}$ − + (−7, 0) $[-7, \infty)$	Root must contain + values	Test Points! 1) Set $= 0$ 2) Factor & solve 3) Test Pts,

$f(x) = \dfrac{x+5}{\sqrt{x^2-9}}$

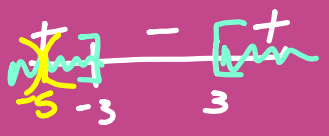
Only test pts on the quantity in the root!

$x^2-9=0$

$(x+3)(x-3)=0$

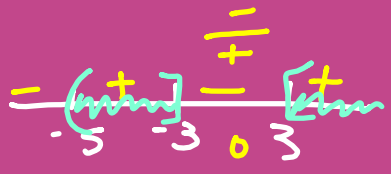
$(-\infty,-3) \cup (3,\infty)$

$g(x) = \dfrac{\sqrt{x^2-9}}{x+5}$



$(-\infty,-5) \cup (-5,-3] \cup [3,\infty)$

$h(x) = \sqrt{\dfrac{x^2-9}{x+5}}$



$(-5,-3] \cup [3,\infty)$