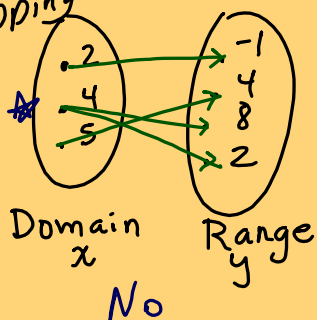


FUNCTIONS, DOMAIN, + RANGE

Mapping

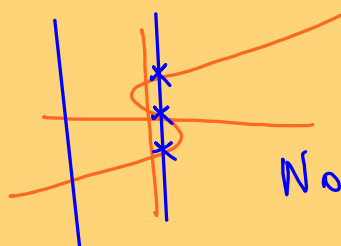
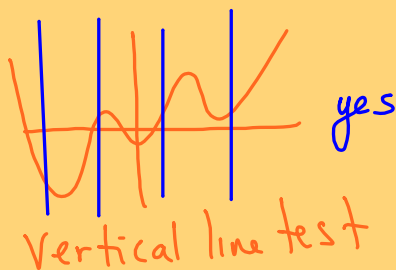


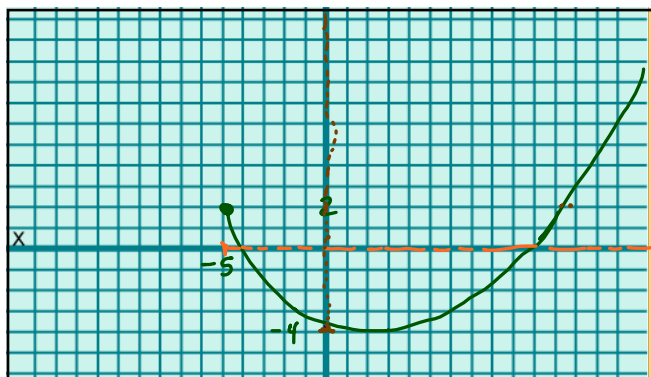
Function - Each x -coordinate is paired with EXACTLY ONE y -coordinate.

$\{(-4, 3)(2, 7)(3, 5)(9, 7)\}$ yes

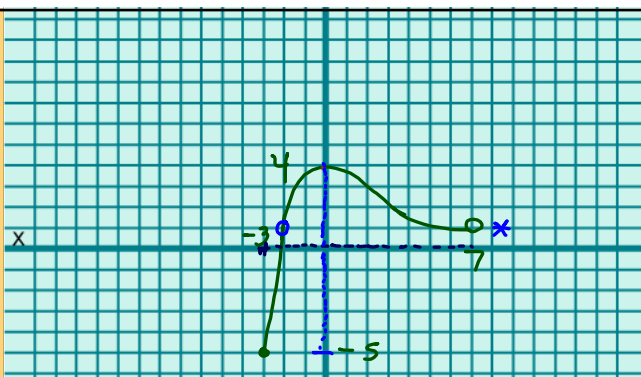
$\{(4, 7)(-5, 3)(11, -9)(4, -7)\}$ No

$\{(-3, 8)(2, 6)(5, -11)(7, -2)(-3, 8)\}$ yes

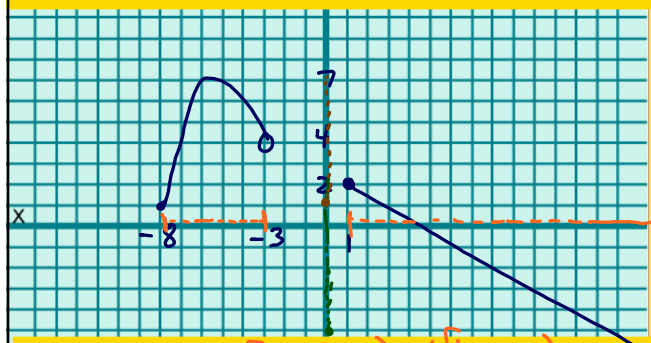




Domain: L to R $[-5, \infty)$
 Range: Low to High $[-4, \infty)$



Domain: $[-3, 7)$
 Range: $[-5, 4]$



Domain: $[-8, -3) \cup [1, \infty)$
 Range: $(-\infty, 7]$

Find domain only

Polynomial

$$f(x) = x^3 + 3x^2 - 4x + 7$$

Rational

$$f(x) = \frac{4x+7}{x^2-9}$$


$$x^2 - 9 = 0$$

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

$$x = 3, -3$$

$$x \neq -3, 3$$

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

Function	Domain Concern	Method
Polynomial	None	\mathbb{R} or $(-\infty, \infty)$
Rational Function	Cannot \div by 0 Denom $\neq 0$	Factor Denom & Solve $x \neq \#$
Even Root	$\sqrt{\quad}, \sqrt{\quad}, \sqrt{\quad}$ cannot have $\sqrt{-\#}$	Test points! 
Odd Root	$\sqrt[3]{\quad}, \sqrt[3]{\quad}$ None	\mathbb{R} or $(-\infty, \infty)$

Even Root

$$f(x) = \sqrt{x+5}$$

$$\sqrt{0} = 0$$

$$- \quad -5 \quad +$$

$$[-5, \infty)$$

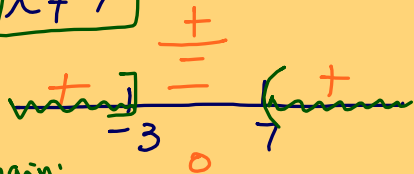
Odd Root

$$\sqrt[3]{-8} = -2$$

$$-2 \cdot -2 \cdot -2$$

$$f(x) = \sqrt{\frac{x+3}{x-7}} \quad \text{Rational Even Root}$$

$$x \neq 7$$



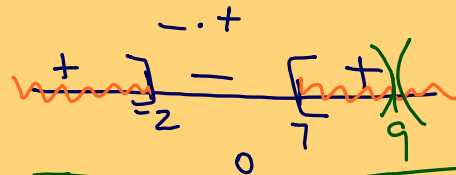
Domain:

$$(-\infty, -3] \cup (7, \infty)$$

$$f(x) = \frac{\sqrt[4]{x^2-5x-14}}{x-9} \quad \text{Rational Even Root}$$

$$x \neq 9$$

$$\frac{\sqrt[4]{x^2-5x-14}}{\sqrt[4]{(x-7)(x+2)}}$$



$$(-\infty, -2] \cup [7, 9) \cup (9, \infty)$$