

Radical Domain and Range

$$y = \sqrt{x}$$

↳ any thing inside a square root has to be positive

Identify the Domain and Range of

$$y = \sqrt{x-2} + 5$$

Domain

↳ $\sqrt{x-2}$ has to be positive or 0

$$\sqrt{x-2} \geq 0$$

set $\sqrt{x-2} = 0$ to solve

$$\sqrt{x-2} = 0$$

$$x-2 = 0$$

$$\boxed{x=2}$$

Now test the numbers around 2 to see which numbers result in a positive output



↳ pick any number less than 2 and more than 2

$$x-2 \text{ if } x=0$$

$$(0)-2 = -2$$

negative number ;)

$$x-2 \text{ if } x=3$$

$$(3)-2 = 1$$

positive number :)

so all values 2 or greater than 2 work

$$\rightarrow [2, \infty)$$

Range

↳ we know the

Domain is 2 to all real numbers

$$[2, \infty)$$

↳ check the y value when $x=2$

$$y = \sqrt{x-2} + 5$$

$$y = \sqrt{2-2} + 5$$

$$y = \sqrt{0} + 5$$

$$\boxed{y=5}$$

↳ so when $x=2$

$$y=5$$

↳ since we know

$\sqrt{x-2}$ is going to

output + positive values

and +5 is just adding and there is no way to get a negative value:

$$[0, \infty)$$