Warm-up

state the shifts/flips then graph each equation: Then state Domain and Range:

① $2+\sqrt{x-1}=y$

② $3-(x+2)^2=y$

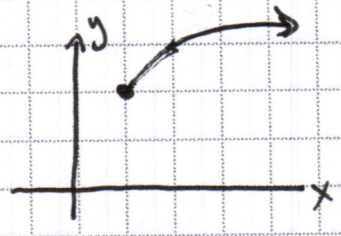
③ $y=\sqrt{3-x}-5$ (make table for this one)

④ $y=-|-2+x|+1$

Answers

① $2+\sqrt{x-1}=y$

shifts 2 up Rt 1



D: $\mathbb{R} \geq 1$

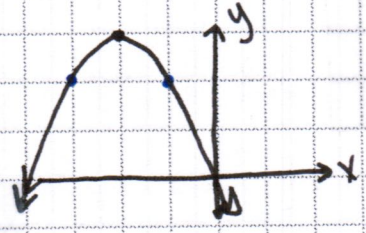
R: $\mathbb{R} \geq 2$

② $3-(x+2)^2=y$

flips over x-axis

shifts left 2 up 3

flips down!



D: $\mathbb{R}$

R: $\mathbb{R} \leq 3$

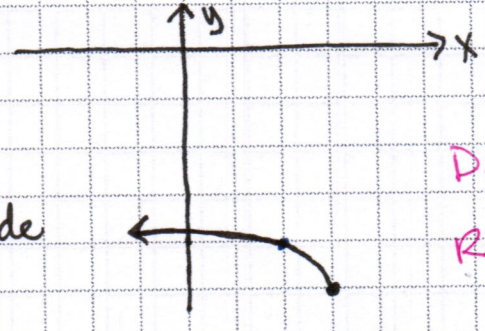
③ $y=\sqrt{-1(x-3)}-5$

flip over y-axis

shifts 3 right

5 down

flips left b/c inside function



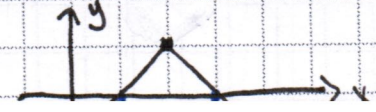
D: $\mathbb{R} \geq -5$

R: $\mathbb{R} \leq 3$

④ $y=-|x-2|+1$

flip over x-axis

shifts 2 right up 1



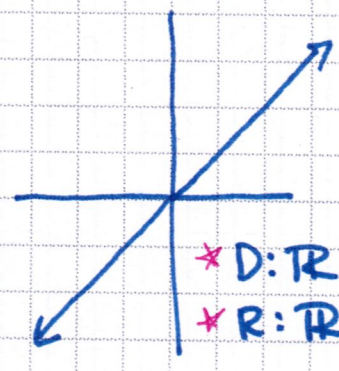
D: $\mathbb{R}$

R: $\mathbb{R} \leq 1$

Parent Functions

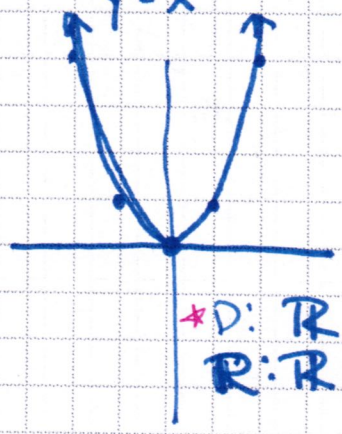
★ always stays this no matter flip or shift

$y = x$



★ D: $\mathbb{R}$
★ R: $\mathbb{R}$

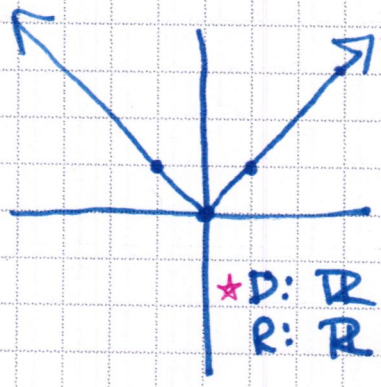
$y = x^2$



★ D: $\mathbb{R}$
R: $\mathbb{R} \geq 0$

R: changes based on flip and shifts (vertex)

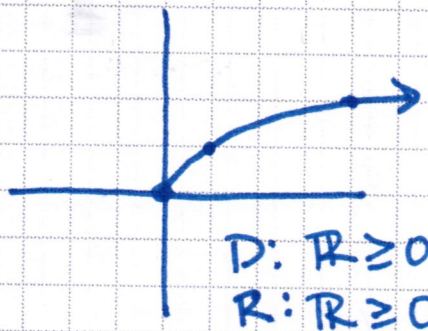
$y = |x|$



★ D: $\mathbb{R}$
R: $\mathbb{R} \geq 0$

R: changes based on shifts.

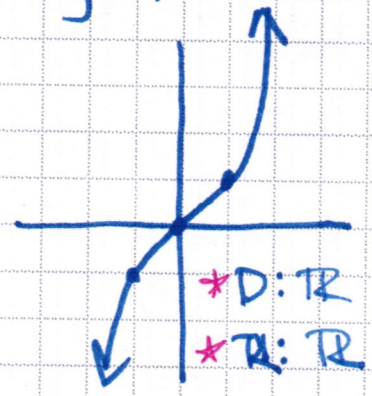
$y = \sqrt{x}$



D: $\mathbb{R} \geq 0$
R: $\mathbb{R} \geq 0$

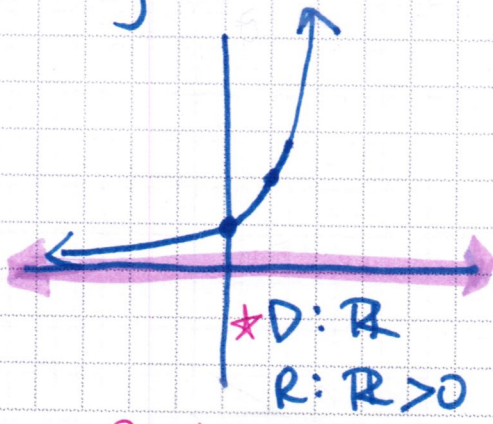
D: and R: changes based on where vertex goes

$y = x^3$



★ D: $\mathbb{R}$
★ R: $\mathbb{R}$

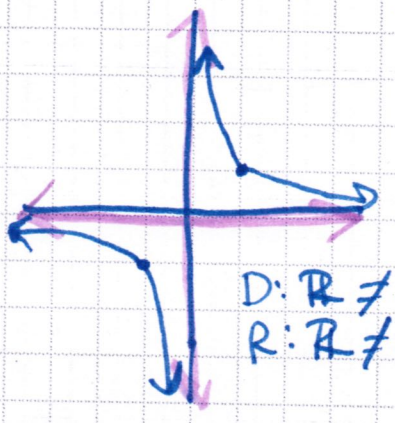
$y = 2^x$



★ D: $\mathbb{R}$
R: $\mathbb{R} > 0$

R: changes based on asy. shift

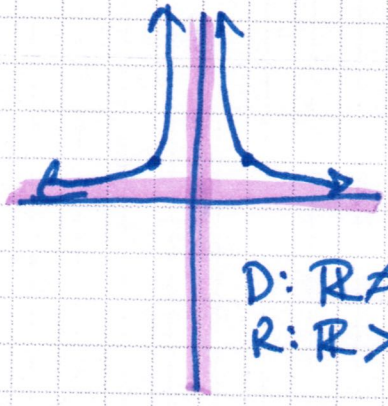
$y = \frac{1}{x}$



D: $\mathbb{R} \neq 0$
R: $\mathbb{R} \neq 0$

D: and R: changes based on asy. shifts

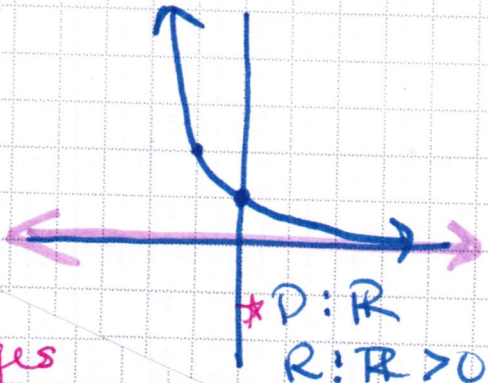
$y = \frac{1}{x^2}$



D: $\mathbb{R} \neq 0$
R: $\mathbb{R} > 0$

D: and R: changes based on asy. shifts

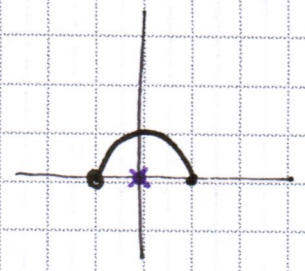
$y = \left(\frac{1}{2}\right)^x$



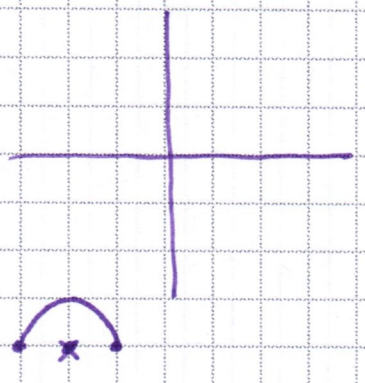
★ D: $\mathbb{R}$
R: $\mathbb{R} > 0$

R: changes based on asy shift.

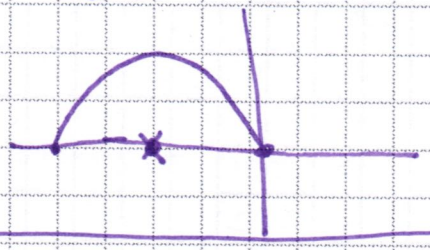
$$y = \sqrt{1 - x^2}$$



$$y = \sqrt{1 - (x+2)^2} - 4$$



$$y = \sqrt{4 - (x+2)^2}$$



Top Half circle equation:

$$y = \sqrt{r^2 - (x-h)^2} - k$$

r = radius (h, k) "center" of half "circle"
"x"