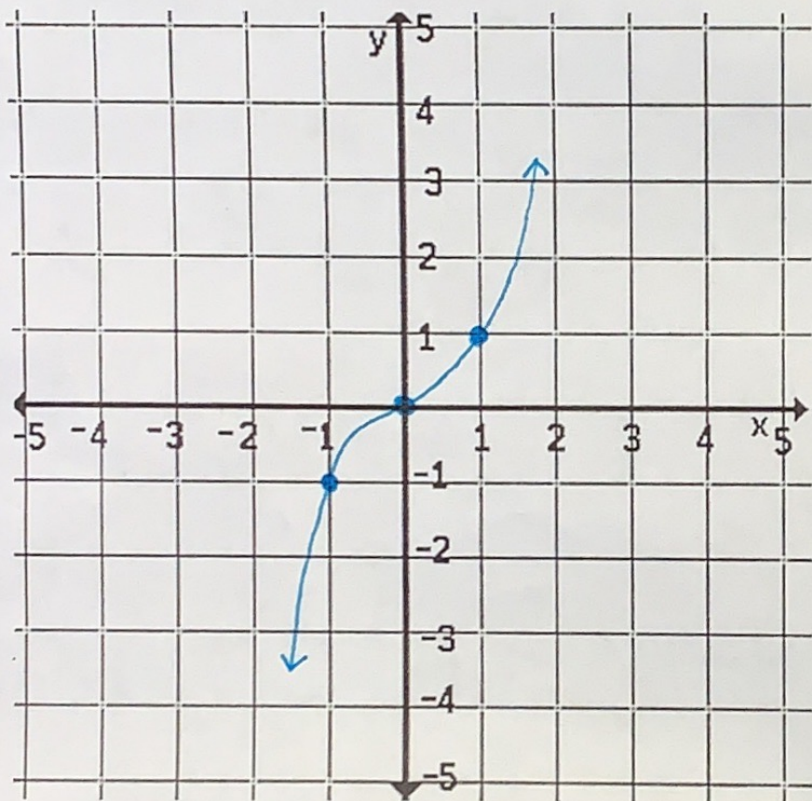


# The Book of Parent Functions

Name: TEACHER NOTES

$$f(x) = x^3$$

Name: cubic

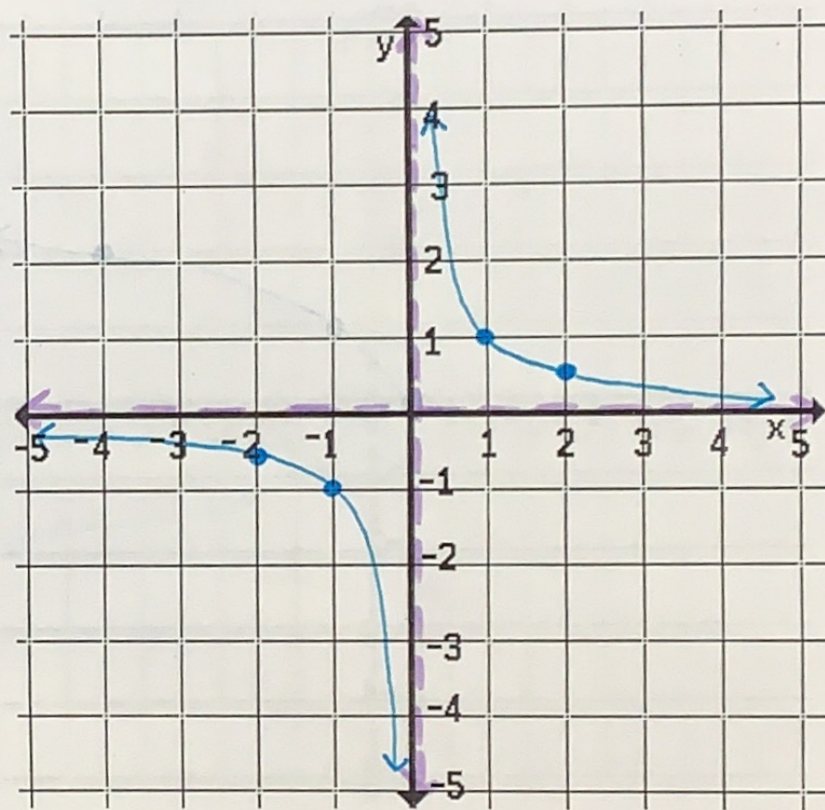


Main Points:

$$(-2, -8) (-1, -1) (0, 0) (1, 1) (2, 8)$$

$$f(x) = \frac{1}{x}$$

Name: rational



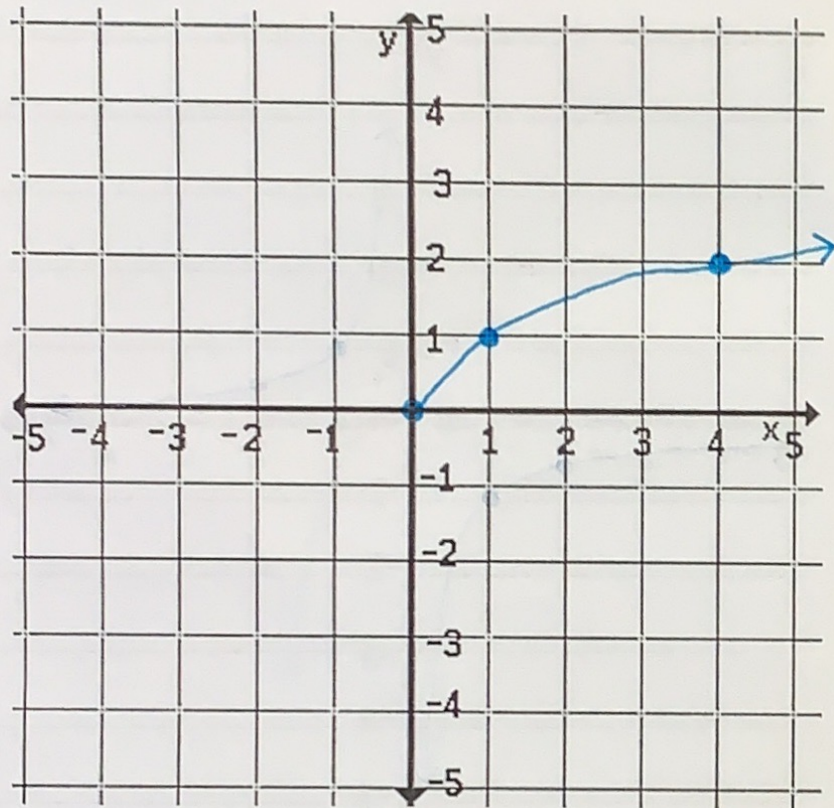
Main Points:

$$(-2, -0.5) (-1, -1) (1, 1) (2, 0.5)$$

Horizontal Asymptote:  $y=0$   
Vertical Asymptote:  $x=0$

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

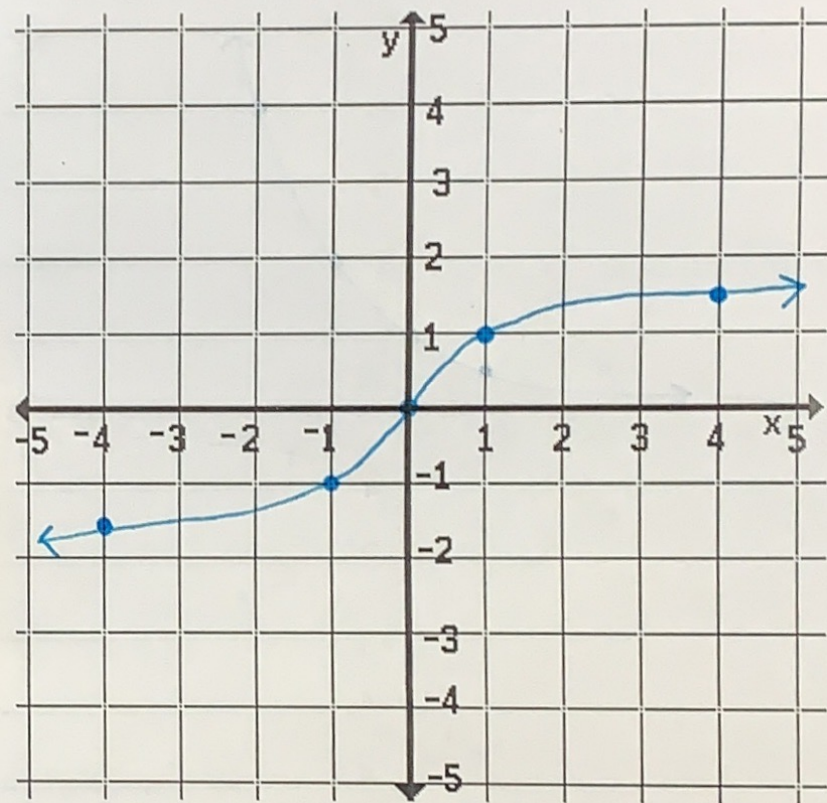
Name: square root (radical)



Main Points:  
(0,0) (1,1) (4,2)

$$f(x) = \sqrt[3]{x}$$

Name: cube root (radical)

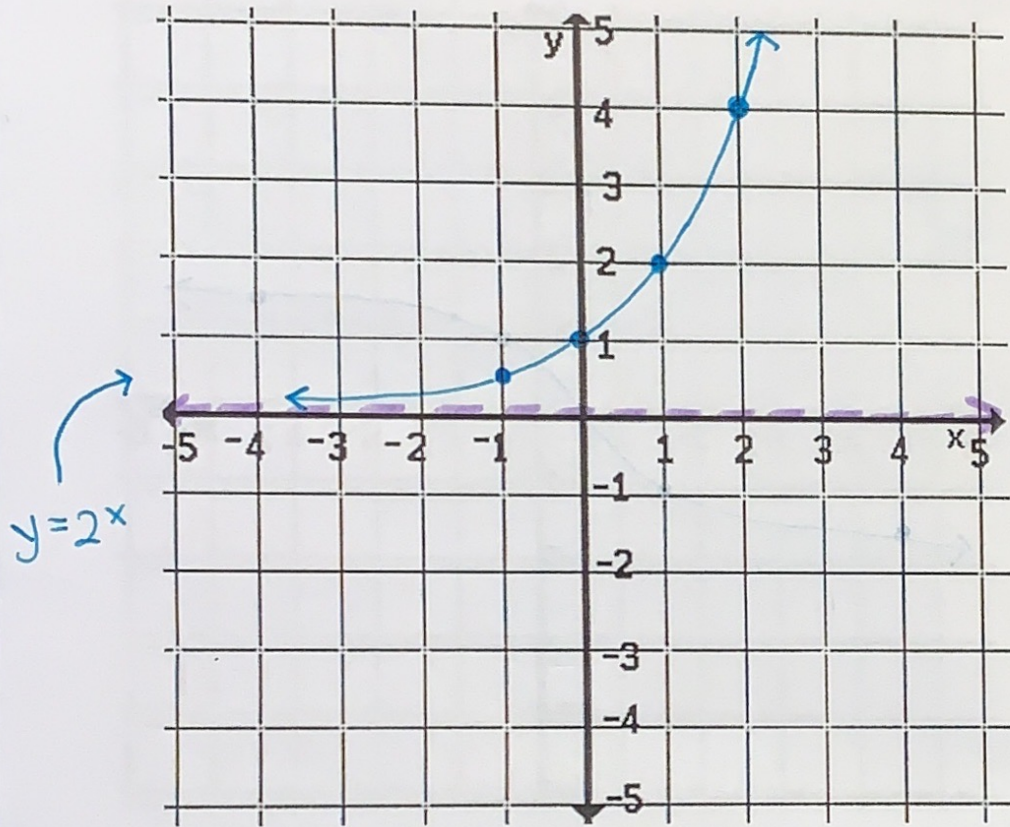


Main Points:  
(-4,-1.5) (-1,-1) (0,0) (1,1) (4,1.5)

$$f(x) = b^x$$

↑ can be any # bigger than 1

Name: exponential



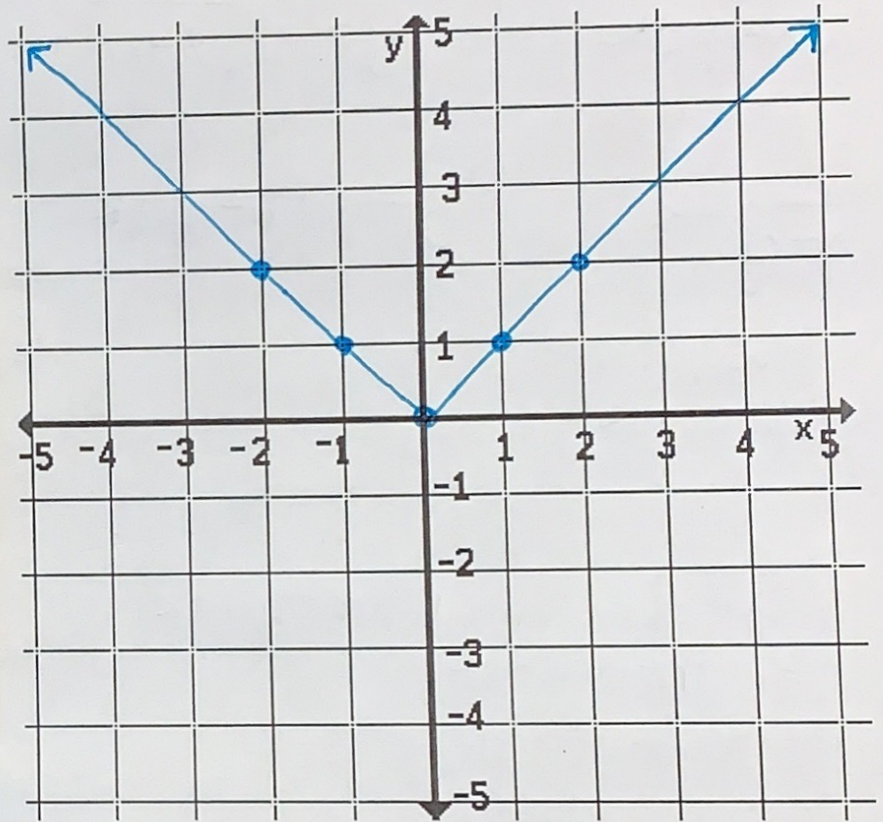
Main Points:

$(-1, 0.5)$   $(0, 1)$   $(1, 2)$   $(2, 4)$

Horizontal Asymptote:  $y=0$

$$f(x) = |x|$$

Name: absolute value



Main Points:

$(-2, 2)$   $(-1, 1)$   $(0, 0)$   $(1, 1)$   $(2, 2)$

# Transformations with all functions

$$y = a(x-h)^2 + k$$

$$y = a(x-h)^3 + k$$

$$y = a\sqrt{x-h} + k$$

$$y = a^3\sqrt[3]{x-h} + k$$

$$y = \frac{(a)}{x-h} + k$$

$$y = a|x-h| + k$$

$$y = (a)2^{x-h} + k$$

$a$  = vertical stretch or shrink

$h$  = right or left

$k$  = up or down