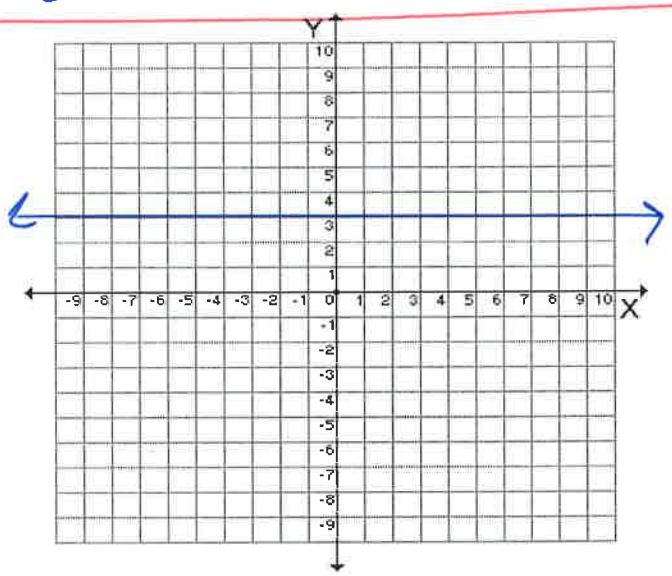
1-5 Parent Functions and Transformations

Constant Function

$f(x) = c$

where c is $\in \mathbb{R}$

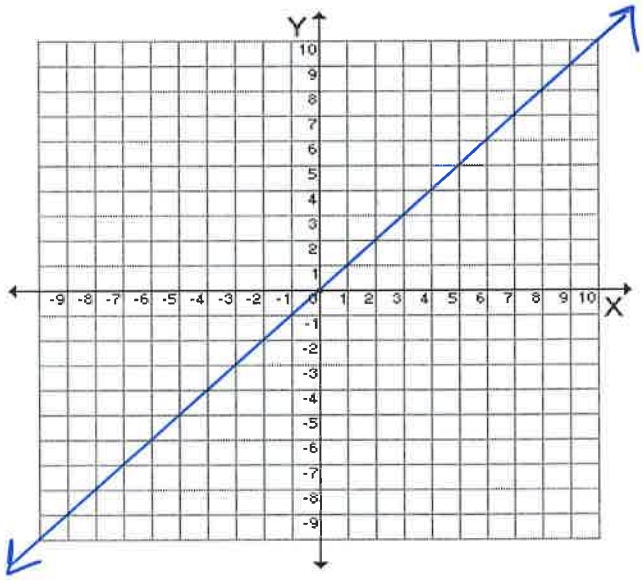
(an element of the real numbers)



Identity Function

$f(x) = x$

passes through all points with coordinates (a, a)



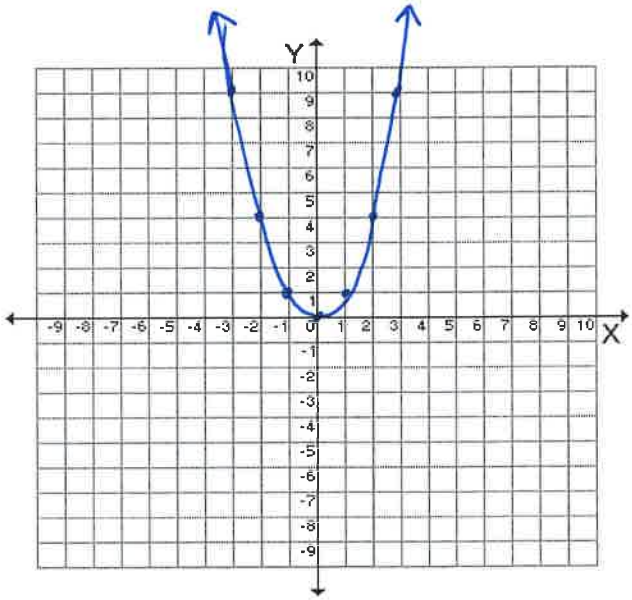
Quadratic Function

$f(x) = x^2$

U-shaped curve

parabola

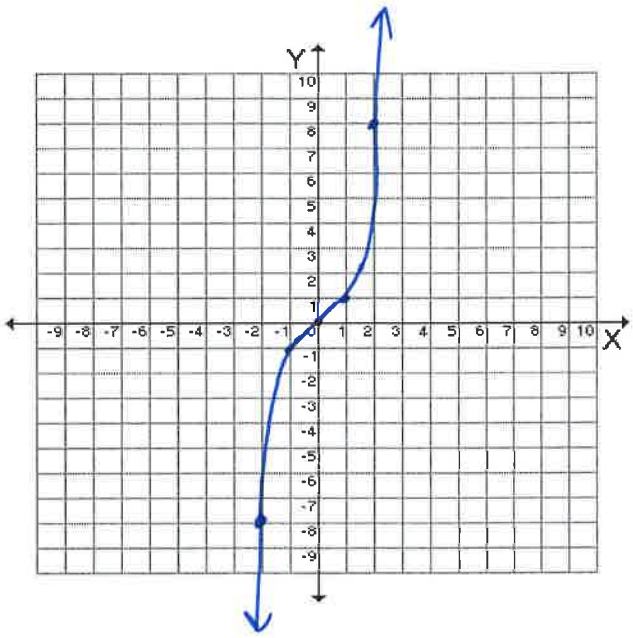
symmetric about the y-axis



Cubic Function

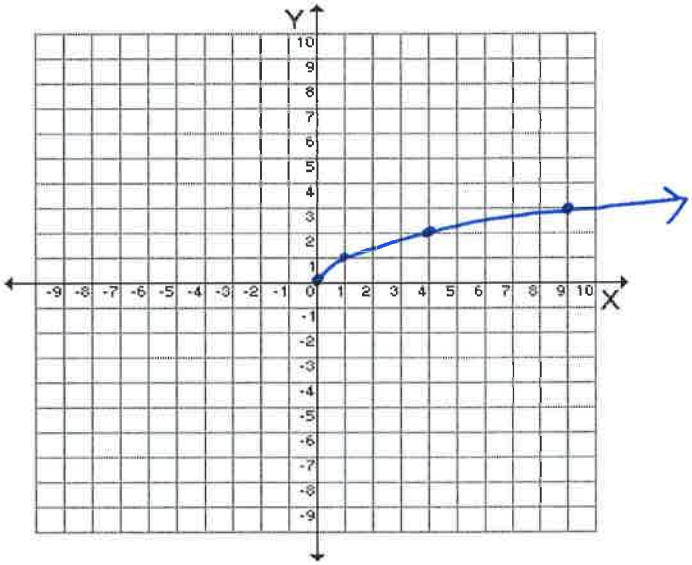
$f(x) = x^3$

symmetric about the origin



Square Root Function

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

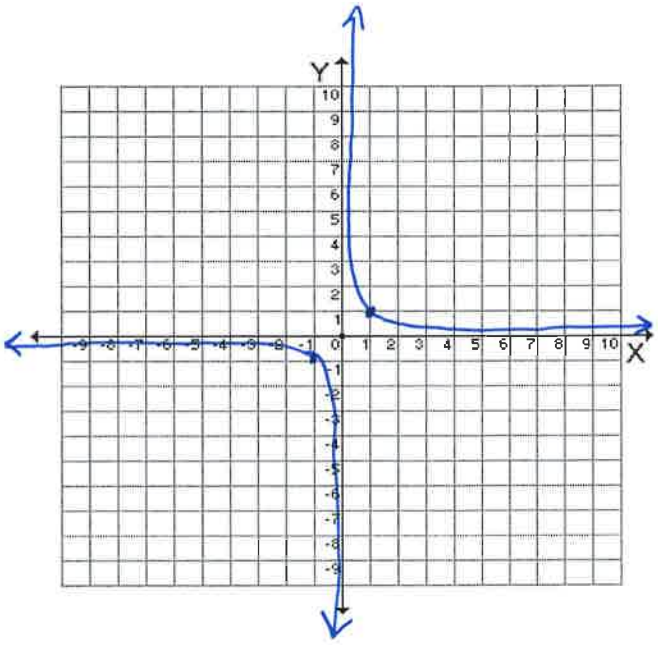


Reciprocal Function

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

HA @ $y = 0$

VA @ $x = 0$

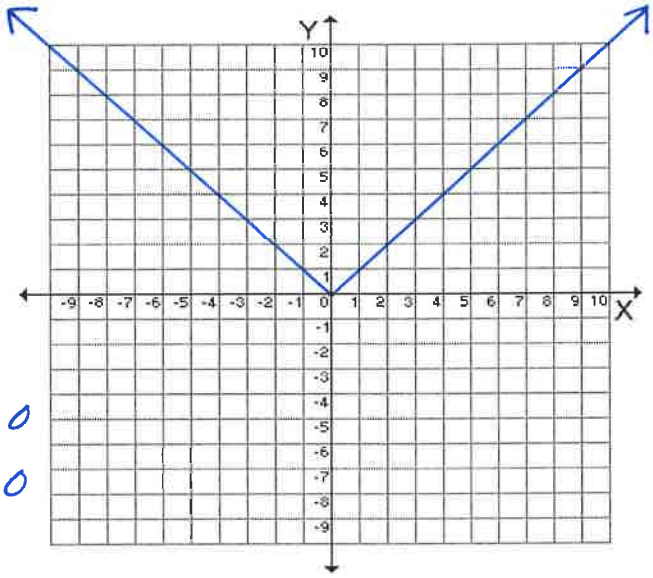


Absolute Value Function

$f(x) = |x|$

V-shaped function

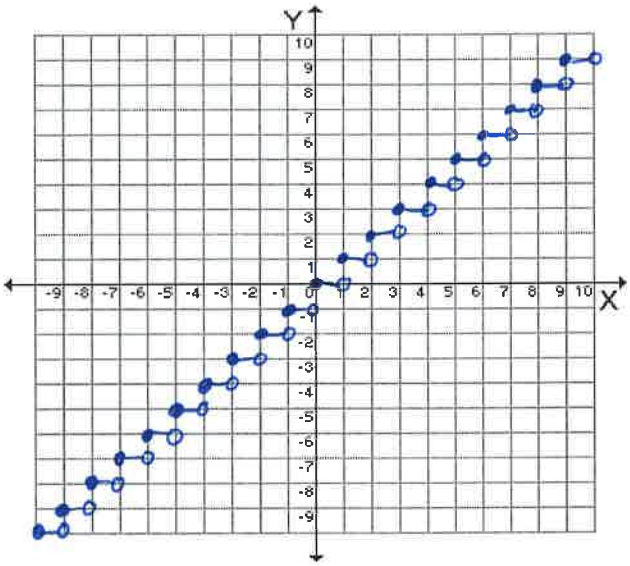
defined as $f(x) = \begin{cases} -x & \text{if } x \leq 0 \\ x & \text{if } x \geq 0 \end{cases}$



Greatest Integer Function

$f(x) = [\![x]\!]$

the greatest integer less than or equal to x.



Ex: $[\![-4]\!] = -4$

$[\![-1.5]\!] = -2$

$[\![\frac{1}{3}]\!] = 0$

AKA: Floor function

$f(x) = \lfloor x \rfloor$

Transformations

$g(x) = f(x) + k \rightarrow$ Vertical Translation

$g(x) = f(x-h) \rightarrow$ Horizontal Translation

$g(x) = -f(x) \rightarrow$ reflection about the x-axis

$g(x) = af(x) \rightarrow$ if $|a|>1$, vertical stretch
if $0<|a|<1$, vertical compression