

❖ Transformations Summary

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

FUNCTION NOTATION	DESCRIPTION	COORDINATE RULE	WHAT CHANGES?
$x^2 + k$	Shift up k units	$(x, y + k)$	Y
$x^2 - k$	Shift down k units	$(x, y - k)$	Y
$(x - h)^2$	Shift right h units	$(x + h, y)$	X
$(x + h)^2$	Shift left h units	$(x - h, y)$	X
$-x^2$	Reflect over x -axis	$(x, -1 \cdot y)$	Y
$(-x)^2$	Reflect over y -axis	$(-1 \cdot x, y)$	X
ax^2	Vertical stretch $\times a$ if $ a > 1$	(x, ay)	Y
ax^2	Vertical compression $\times a$ if $0 < a < 1$	(x, ay)	Y