# lulumath

# Transformations of Quadratic Graphs #3 - What does $h$ in $y = a(x - h)^2 + k$ do to the graph?
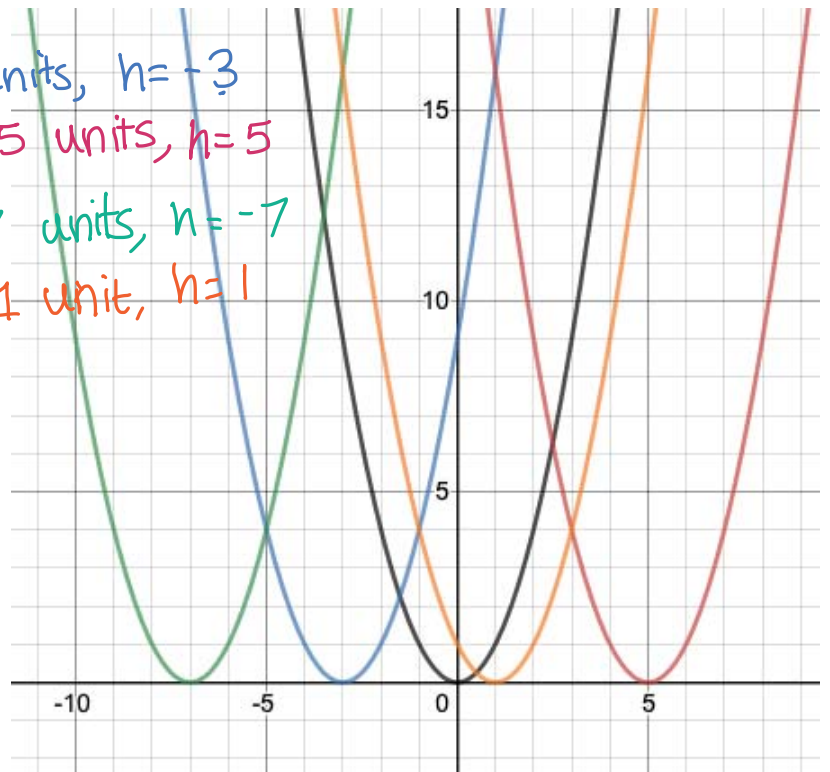
Video Notes

[Video Link](Video Link)

# Transformations of Quadratic Graphs #3 - What does the $h$ in $y = a(x - h)^2 + k$ do to the graph?

↳ vertex form

Use graphing technology to see what changing the $h$ value does to the parent graph of a parabola: $y = x^2$.

$(x - 3)$

$y = (x + 3)^2$ → shifted **left** by 3 units, $h = -3$

$y = (x - 5)^2$ → shifted **right** by 5 units, $h = 5$

$y = (x + 7)^2$ → shifted **left** by 7 units, $h = -7$

$y = (x - 1)^2$ → shifted **right** by 1 unit, $h = 1$

**Conclusion:** $y = x^2$ vs. $y = (x - h)^2$

$h > 0$ (positive) → horizontal translation to the **right**
 *quick note: $h$ will "appear" to be negative
 ex: $y = (x - 4)^2$ → 4 **right**

$h < 0$ (negative) → horizontal translation to the **left**
 *quick note: $h$ will "appear" to be positive
 ex: $y = (x + 2)^2$ → 2 left