



- When there is $y + 7$ in the equation, then there is a VT of -7 units. This will result in a graph that is shifted 7 units down from $y = x^2$.
- When there is $y - 4$ in the equation, then there is a VT of 4 units. This will result in a graph that is shifted 4 units up from $y = x^2$.

Summary

Equation:

$$y - k = x^2$$

$$\boxed{VT = k}$$

Mapping Rule:

$$(x, y) \rightarrow (x, y + k)$$

- The Vertical Translation is the **OPPOSITE** of the value added to y in the equation.
- The Vertical Translation is the **SAME** as the value added to y in the mapping rule.
- When $VT > 0$, the graph is shifted k units **UP** from $y = x^2$.
- When $VT < 0$, the graph is shifted k units **DOWN** from $y = x^2$.