





When there is  $(x + 3)^2$  in the equation, then there is a HT of -3 units. This will result in a graph that is shifted 3 units to the left of  $y = x^2$ .

When there is  $(x - 5)^2$  in the equation, then there is a HT of 5 units. This will result in a graph that is shifted 5 units to the right of  $y = x^2$ .

### Summary

Equation:

$$y = (x - h)^2$$

$$\boxed{\text{HT} = h}$$

Mapping Rule:

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

- The Horizontal Translation is the **OPPOSITE** of the value added to x in the equation.
- The Horizontal Translation is the **SAME** as the value added to x in the mapping rule.
- When  $\text{HT} > 0$ , the graph is shifted h units to the **RIGHT** of  $y = x^2$ .
- When  $\text{HT} < 0$ , the graph is shifted h units to the **LEFT** of  $y = x^2$ .