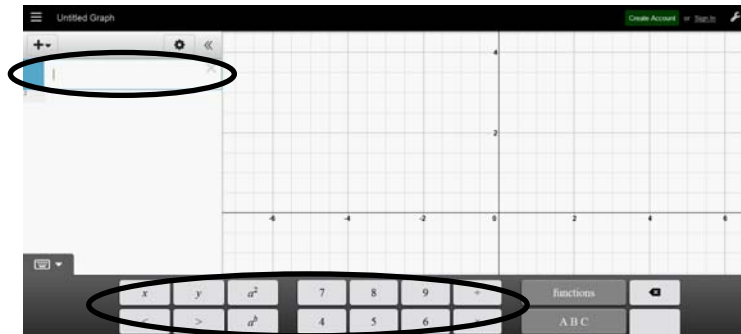


Worksheet 4-5: Quadratic Relations $y = (x - h)^2$

Go to <https://www.desmos.com/calculator> (or click link [HERE](#))

Enter the equation of the quadratic function in the box on the top left corner using the bottom keys.



Investigation 1: $y = (x - h)^2$

(a) Graph $y = x^2$ and $y = (x - 1)^2$ on the same axes.

Compare the two parabolas,

(i) how are they similar?

(ii) how are they different?

(b) Graph $y = x^2$ and $y = (x - 3)^2$ on the same axes.

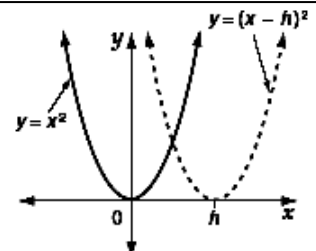
Compare the two parabolas,

(i) how are they similar?

(ii) how are they different?

The graph of the quadratic relation $y = (x - h)^2$ can be obtained from the graph of $y = x^2$ by a horizontal translation of h units to the right.

The vertex of $y = (x - h)^2$ is at $(h, 0)$ and its x -intercept is h .



Investigation 2: $y = (x + h)^2$

(a) Graph $y = x^2$ **and** $y = (x + 6)^2$ **on the same axes.**

Compare the two parabolas,

(i) how are they similar?

(ii) how are they different?

(b) Graph $y = x^2$ **and** $y = (x + 2)^2$ **on the same axes.**

Compare the two parabolas,

(i) how are they similar?

(ii) how are they different?

The graph of the quadratic relation $y = (x + h)^2$ can be obtained from the graph of $y = x^2$ by a horizontal translation of h units to the left.

The vertex of $y = (x + h)^2$ is at $(-h, 0)$ and its x -intercept is $-h$.

1. For each of the following parabolas, state the vertex, x -intercept, axis of symmetry and equation for the quadratic relation.

