

Notes 6.3

Draw the graphs of both equations on your calculator.

1. $y = x^2$ Ψ $y = (x - 8)^2$ ∇

What transformation maps the first equation on to the second?

Translation (8 units to right)

$T_{8,0}$

2. $y = x^2$ $y = x^2 + 3$

What transformation maps the first equation on to the second?

up 3 $T_{0,3}$

Graph Translation Theorem

To write the equation of a translation $T_{h,k}$

replace
 x with $(x - h)$
 and
 y with $(y - k)$

$y = x^2$
 $y - k = (x - h)^2$
 Vertex Form
 vertex is: (h, k)

Ex. 1

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

Find an equation for the image of the graph of $y = 5x^2$ under the translation $T_{-\frac{2}{3}, 6}$.

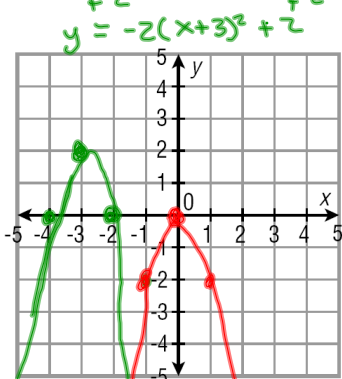
$y - 6 = 5(x + \frac{2}{3})^2$
 $y - 6 = 5(x + \frac{2}{3})^2$
 vertex: $(-\frac{2}{3}, 6)$

Give an equation for the axis of symmetry.

$x = -\frac{2}{3}$
 go through vertex

Ex. 2

a. Graph $y - 2 = -2(x + 3)^2$.

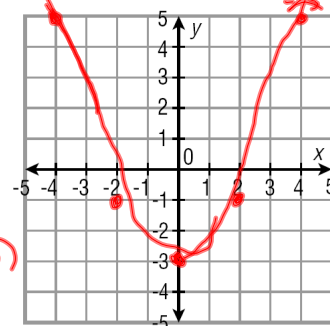


b. What translation maps the equation in (a.) to $y = -2x^2$?

$T_{3,-2}$

Ex. 2

a. Sketch the graph of $y + 3 = \frac{1}{2}x^2$.



b. Give an equation for the axis of symmetry of the parabola.

$x = 0$

Ex. 4.

Give an equation for the image of the graph of $y = x^2$ under the translation "2 units left, 5 units up."

$$y - 5 = (x + 2)^2$$

$T_{-2, 5}$

Name the vertex of the image.

$(-2, 5)$

Give an equation for the axis of symmetry.

$x = -2$