

Lesson 4.4 • Translations and the Quadratic Family

Name _____ Period _____ Date _____

1. Describe the translations of the graph of $y = x^2$ needed to produce the graph of each equation.

a. $y = x^2 - 6$

b. $y = (x + 5)^2$

c. $y = (x - 3)^2 - 9$

2. Find the vertex of each parabola.

a. $y = x^2 + 3$

b. $y = (x - 2)^2$

c. $y = -8 + (x + 5)^2$

3. Each parabola described is the graph of $y = x^2$. Write an equation for each parabola and sketch its graph.

a. The parabola is translated horizontally -3 units.

b. The parabola is translated vertically 1 unit.

c. The parabola is translated horizontally 2 units and vertically -3 units.

4. Describe what happens to the graph of $y = x^2$ in the following situations.

a. y is replaced with $(y + 1)$.

b. x is replaced with $(x - 5)$.

5. Solve.

a. $x^2 + 6 = 31$

b. $x^2 - 12 = 52$

c. $(x - 3)^2 = 100$

d. $(x + 7)^2 = 144$

e. $(x + 4)^2 - 5 = 31$

f. $-20 + (x - 5)^2 = 3$