

Find the number needed to make each expression a perfect square. Then write the expression as (side length)<sup>2</sup>.

1.  $x^2 + 14x + \underline{\hspace{1cm}}$

2.  $x^2 - 12x + \underline{\hspace{1cm}}$

3.  $x^2 + \underline{\hspace{1cm}}x + 100$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Write each in Vertex Form.

4.  $f(x) = x^2 - 8x + 13$

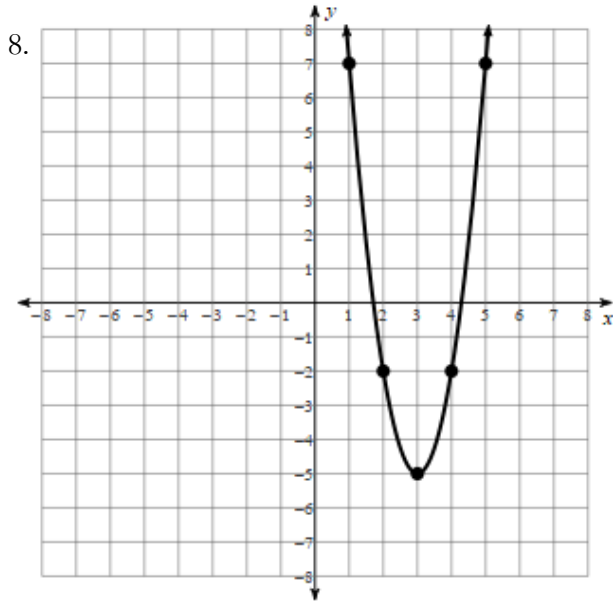
5.  $f(x) = 3x^2 - 12x - 15$

Expand to Write your Equation in Standard Form

6.  $f(x) = (x - 6)^2 + 3$

7.  $f(x) = -2(x + 5)^2 - 17$

Use the graph to answer the questions.



8.

Write the equation of the parabola in vertex form.

Expand to write the equation of the parabola in standard form.

Create a bulleted list of the transformations from  $F(x) = x^2$ .

Use the information above to fill in the key features for this quadratic.

Vertex: \_\_\_\_\_

Max/Min: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Second Difference: \_\_\_\_\_

y - intercept: \_\_\_\_\_

# of x-intercept(s): \_\_\_\_\_

Factor Completely

9.  $x^2 - 4x - 45$

10.  $x^2 - 16$

11.  $2x^2 + 26x + 84$

12.  $3x^2 - 12$

13.  $8x^2 + 2x - 3$

14.  $3x^2 - 12x - 96$