

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

$(14/2)^2 = (7)^2$

$(-12/2)^2 = (-6)^2$

$(6/2)^2 = 100$

$x^2 + 14x + 49$

$x^2 - 12x + 36$

$x^2 + 20x + 100$

$(x+7)^2$

$(x-6)^2$

$(x+10)^2$

Write each in Vertex Form.

$(-8/2)^2 = (-4)^2$   $x^2 - 8x + \underline{\quad} + 13 = \underline{\quad}$

$(-4/2)^2 = (-2)^2$

$3(x^2 - 4x + \underline{4}) - 15 = \underline{12}$

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

$x^2 - 8x + 16 + 13 - 16$   
 $(x-4)^2 - 3$

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

$3(x-2)^2 - 27$

$f(x) = (x-4)^2 - 3$

$f(x) = 3(x-2)^2 - 27$

Expand to Write your Equation in Standard Form

$(x-6)(x-6) + 3$   
 $x^2 - 12x + 36 + 3$   
 $x^2 - 12x + 39$

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

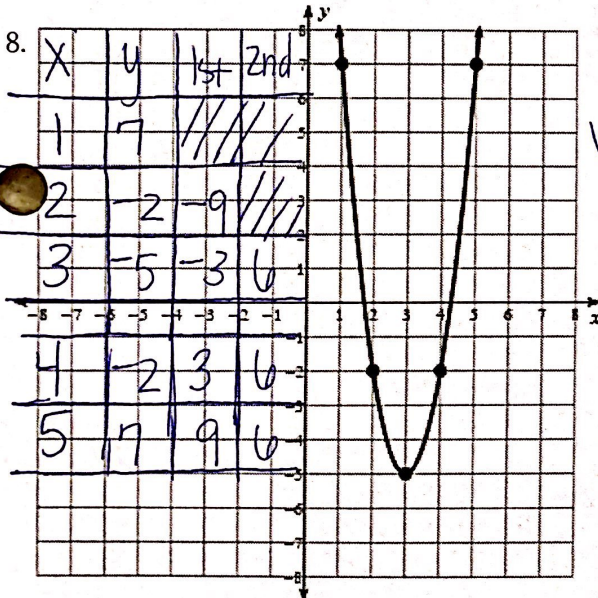
7.  $f(x) = -2(x+5)^2 - 17$

$-2(x+5)(x+5) - 17$   
 $-2(x^2 + 10x + 25) - 17$   
 $-2x^2 - 20x - 50 - 17$   
 $-2x^2 - 20x - 67$

$f(x) = x^2 - 12x + 39$

$f(x) = -2x^2 - 20x - 67$

Use the graph to answer the questions.



Write the equation of the parabola in vertex form.

$a = 1/2(b) = 3$   $f(x) = 3(x-3)^2 - 5$

Vertex (3, -5)

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

$f(x) = 3(x-3)(x-3) - 5$   
 $= 3(x^2 - 6x + 9) - 5$   
 $= 3x^2 - 18x + 27 - 5$   
 $= 3x^2 - 18x + 22$

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

- Vertical stretch by a factor of 3
- Right 3
- down 5

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

Vertex: (3, -5)

Max/Min: MIN

Axis of Symmetry: x=3

Second Difference: 6

y-intercept: (0, 22)

# of x-intercept(s): 2

Factor Completely

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

$(x-9)(x+5)$

10.  $x^2 - 16$

$(x+4)(x-4)$

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

$2(x^2 + 13x + 42)$

$2(x+6)(x+7)$

12.  $3x^2 - 12$

$3(x^2 - 4)$   
 $3(x+2)(x-2)$

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

$(4x+3)(2x-1)$

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

$3(x^2 - 4x - 32)$

$3(x-8)(x+4)$