Name: KEY Period: Date:

Practice Worksheet: Completing the Square

Factor each perfect square trinomial as the square of a binomial.

1] $x^2 + 8x + 16$ $(x+4)^2$	2] $x^2 - 30x + 225$ $(x-15)^2$	3] $x^2 + 7x + \frac{49}{4}$ $(x+\frac{7}{2})^2$
4] $x^2 - 3x + \frac{9}{4}$ $(x-\frac{3}{2})^2$	5] $16x^2 + 40x + 25$ $(4x+5)^2$	6] $4x^2 - 28x + 49$ $(2x+7)^2$

Find the value of c that makes the trinomial a perfect square. Then write the expression as the square of a binomial.

7] $x^2 + 6x + c$ 9 $(x+3)^2$	8] $x^2 - 10x + c$ 25 $(x-5)^2$	9] $x^2 + 3x + c$ $\frac{9}{4}$ $(x+\frac{3}{2})^2$
10] $x^2 - 9x + c$ $\frac{81}{4}$ $(x-\frac{9}{2})^2$	11] $4x^2 + 20x + c$ $2x \quad 2\cdot 2x \quad 25$ $(2x+5)^2$	12] $9x^2 - 12x + c$ $3x \quad 2\cdot 3x\cdot 2$ $(3x-2)^2$

Solve the quadratic equation by completing the square. Show work. Simplify radicals

13] $x^2 - 10x = -10$ $x^2 - 10x + 25 = -10 + 25$ $(x-5)^2 = 15$ $x = 5 \pm \sqrt{15}$	14] $x^2 + 6x + 10 = 0$ $x^2 + 6x = -10$ $(x+3)^2 = -1$ No Solution	15] $x^2 = 4 - 8x$ $x^2 + 8x + \boxed{16} = 4 + 16$ $(x+4)^2 = 20$ $x + 4 = \pm 2\sqrt{5}$ $x = -4 \pm 2\sqrt{5}$

16] $3x^2 + 36x = -42$

$x^2 + 12x = -14$

$x^2 + 12x + 36 = 22$

$(x+6)^2 = 22$

$x = -6 \pm \sqrt{22}$

17] $4x^2 + 20x + 25 = 0$

$(2x+5)^2 = 0$

$2x + 5 = 0$

$x = -5/2$

18] $6x^2 = 12x + 18$

$x^2 = 2x + 3$

$x^2 - 2x + 1 = 3 + 1$

$(x-1)^2 = 4$

$x - 1 = \pm 2$

$x = 1 \pm 2$

$x = 3 \quad x = -1$

Write the quadratic function in vertex form and identify the coordinates of the vertex.

19] $y = x^2 - 8x + 10$

$y = (x^2 - 8x + 16) + 10 - 16$

$y = (x-4)^2 - 6$

$(4, -6)$

20] $y = x^2 + 6x + 4$

$y = (x^2 + 6x + 9) + 4 - 9$

$y = (x+3)^2 - 5$

$(-3, -5)$

21] $y = x^2 - 12x + 46$

$y = (x^2 - 12x + 36) + 46 - 36$

$y = (x-6)^2 + 10$

$(6, 10)$

22] $y = x^2 + 14x + 58$

$y = (x^2 + 14x + 49) + 58 - 49$

$y = (x+7)^2 + 9$

$(-7, 9)$

23] $y = 3x^2 - 24x + 46$

$y = 3(x^2 - 8x + 16) + 46 - 48$

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

$(4, -2)$