

Solving Quadratic Equations By Completing the Square Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each equation by completing the square.

1)  $p^2 + 14p - 38 = 0$

$(\frac{14}{2})^2$   
 $p^2 + 14p + 49 = 38 + 49$   
 $(p+7)^2 = \sqrt{87}$   
 $p+7 = \pm\sqrt{87}$

3)  $a^2 + 14a - 51 = 0$

$p = -7 \pm \sqrt{87}$

$a^2 + 14a + 49 = 51 + 49$

$(a+7)^2 = 100$

$a+7 = \pm 10$   
 $-7 \quad -7$

$a = -7 \pm 10$

$a = -17$   
 $a = 3$

5)  $x^2 + 6x + 8 = 0$

$x^2 + 6x + 9 = -8 + 9$

$(x+3)^2 = 1$

$x+3 = \pm 1$

$x = -3 \pm 1$

$x = -4$   
 $x = -2$

7)  $x^2 + 14x - 15 = 0$

$x^2 + 14x + 49 = 15 + 49$

$(x+7)^2 = 64$

$x+7 = \pm 8$

$x = -7 \pm 8$

$x = -15$   
 $x = 1$

9)  $r^2 - 4r - 91 = 7$

$(\frac{-4}{2})^2$   
 $r^2 - 4r + 4 = 98 + 4$

$(r-2)^2 = 102$

$r-2 = \pm\sqrt{102}$

$r = 2 \pm \sqrt{102}$

11)  $k^2 - 4k + 1 = -5$

$(\frac{-4}{2})^2$   
 $k^2 - 4k + 4 = -6 + 4$

$(k-2)^2 = -2$

$k-2 = \sqrt{-2}$

No Real Solutions

2)  $v^2 + 6v - 59 = 0$

$(\frac{6}{2})^2$   
 $v^2 + 6v + 9 = 59 + 9$   
 $(v+3)^2 = \sqrt{68}$

$v+3 = \pm\sqrt{68}$

$v = -3 \pm \sqrt{68} \rightarrow -3 \pm 2\sqrt{17}$

$68$   
 $2 \sqrt{34}$   
 $2 \sqrt{17}$

4)  $x^2 - 12x + 11 = 0$

$(\frac{12}{2})^2$   
 $x^2 - 12x + 36 = -11 + 36$

$(x-6)^2 = 25$

$x-6 = \pm 5$   
 $+6 \quad +6$

$x = 6 \pm 5$

6)  $n^2 - 2n - 3 = 0$

$(\frac{-2}{2})^2$   
 $n^2 - 2n + 1 = 3 + 1$

$(n-1)^2 = 4$

$n-1 = \pm 2$   
 $n = 1 \pm 2$

$n = 3$   
 $n = -1$

$n = 3$   
 $n = -1$

8)  $k^2 - 12k + 23 = 0$

$(\frac{-12}{2})^2$   
 $k^2 - 12k + 36 = -23 + 36$

$(k-6)^2 = 13$

$k-6 = \pm\sqrt{13}$

$k = 6 \pm \sqrt{13}$

10)  $x^2 - 10x + 26 = 8$

$(\frac{10}{2})^2$   
 $x^2 - 10x + 25 = -18 + 25$

$(x-5)^2 = 7$

$x-5 = \pm\sqrt{7}$

$x = 5 \pm \sqrt{7}$

12)  $b^2 + 2b = -20$

$(\frac{2}{2})^2$   
 $b^2 + 2b + 1 = -20 + 1$

$(b+1)^2 = -19$

No Real Solutions