Name Key

Date _____ Period ____

Completing the Square

Find the value of c that completes the square.

1) $x^2 + 6x + c$

$(x+3)^2$ $\quad c = 9$

3) $x^2 - 34x + c$

$\frac{-34}{2} = -17^2 = 289 = c$

5) $r^2 - 6r + c$

$\frac{-6}{2} = -3^2 \quad c = 9$

7) $x^2 - 38x + c$

$\frac{-38}{2} = -19^2 = 361 = c$

9) $x^2 - \frac{25}{13}x + c$

$\frac{-25}{13} \cdot \frac{1}{2} = \left(\frac{-25}{26}\right)^2 = \frac{625}{676} = c$

11) $z^2 + \frac{11}{8}z + c$

$\frac{11}{8} \cdot \frac{1}{2} = \left(\frac{11}{16}\right)^2 = \frac{121}{256} = c$

13) $m^2 + 40m + c$

$\frac{40}{2} = 20^2 \quad c = 400$

15) $x^2 - x + c$

$\frac{-1}{2} = \left(\frac{-1}{2}\right)^2 = 1/4 = c$

17) $a^2 - 8a + c$

$\frac{-8}{2} = -4^2 = 16 = c$

Name Key

Solving Quadratic Equations By Completing the Square Date_____ Period____

Solve each equation by completing the square.

1) $v^2 + 10v - 21 = 0$

$V^2 + 10V = 21$

$V^2 + 10V + 25 = 46$

$(V+5)^2 = 46$

$V+5 = \pm\sqrt{46}$

$\boxed{V = -5 \pm \sqrt{46}}$

2) $b^2 - 4b - 12 = 0$

$b^2 - 4b = 12$

$b^2 - 4b + 4 = 16$

$(V-2)^2 = 16$

$V-2 = \pm 4$

$V-2=4$ $\quad V-2=-4$

$\boxed{V=6}$ $\quad \boxed{V=-2}$

3) $v^2 - 14v - 44 = 0$

$V^2 - 14V = 44$

$V^2 - 14V + 49 = 93$

$(V-7)^2 = 93$

$V-7 = \pm\sqrt{93}$

$\boxed{V = 7 \pm \sqrt{93}}$

4) $v^2 - 2v - 35 = 0$

$V^2 - 2V = 35$

$V^2 - 2V + 1 = 36$

$(V-1)^2 = 36$

$V-1 = \pm 6$

$V-1=6$ $\quad V-1=-6$

$\boxed{V=7}$ $\quad \boxed{V=-5}$

5) $r^2 + 4r - 56 = 0$

$r^2 + 4r = 56$

$r^2 + 4r + 4 = 60$

$(r+2)^2 = 60$

$r+2 = \pm\sqrt{60}$

$\boxed{r = -2 \pm 2\sqrt{15}}$

6) $x^2 - 12x - 10 = 0$

$X^2 - 12X = 10$

$X^2 - 12X + 36 = 46$

$(X-6)^2 = 46$

$X-6 = \pm\sqrt{46}$

$\boxed{X = 6 \pm \sqrt{46}}$

7) $n^2 - 4n + 57 = -5$

$n^2 - 4n = -62$

$n^2 - 4n + 4 = -58$

$(n-2)^2 = -58$

$n-2 = \pm\sqrt{-58}$

$\boxed{n = 2 \pm i\sqrt{58}}$

58
2 29

8) $n^2 - 4n + 5 = 8$

$n^2 - 4n = 3$

$n^2 - 4n + 4 = 7$

$(n-2)^2 = 7$

$n-2 = \pm\sqrt{7}$

$\boxed{n = 2 \pm \sqrt{7}}$