

Solving Quadratic Equations by Completing the Square

Find the value of c that creates a perfect square trinomial.

1) $x^2 - 8x + c$

$$c = \left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$$

2) $x^2 + 12x + c$

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

4) $x^2 + 15x + c$

Create a perfect square trinomial. Then, write the expression in factored form.

5) $x^2 + 10x + 2 = 0$

$$\begin{array}{cc} -2 & -2 \\ \hline \end{array}$$

$$x^2 + 10x \quad \underline{\quad} = -2$$

$$\left(\frac{10}{2}\right)^2 = 5^2 = 25$$

$$x^2 + 10x + 25 = -2 + 25$$

$$(x + 5)^2 = 23$$

6) $a^2 + 14a + 3$

7) $m^2 - 12m - 5$

8) $z^2 - 6z - 8$

SOLVE each quadratic equation by completing the square. Round to the nearest hundredth.

9) $r^2 + 10r - 12 = 0$

$$+12 +12$$

$$r^2 + 10r \quad = 12$$

$$\left(\frac{10}{2}\right)^2 = 5^2 = 25$$

$$r^2 + 10r + 25 = 12 + 25$$

$$(r+5)^2 = 37$$

$$\sqrt{(r+5)^2} = \pm\sqrt{37}$$

$$r+5 = \pm\sqrt{37}$$

$$r = -5 \pm \sqrt{37}$$

$$r = -5 + \sqrt{37} \quad r = -5 - \sqrt{37}$$

$$r \approx 1.08 \quad r \approx -11.08$$

10) $r^2 + 14r - 87 = 8$

11) $n^2 + 6n - 55 = 0$

12) $n^2 + 18n + 72 = 0$