

**Solve each equation for x:**

1.  $x^2 = 169$   $x = \pm 13$

2.  $x^2 - 625 = 0$   $x = \pm 25$

3.  $81x^2 = 25$   $x = \pm \frac{5}{9}$

4.  $(x - 4)^2 - 25 = 0$   $x = 9, x = -1$

5.  $(x + 1)^2 - 1 = 0$   $x = 0, x = -2$

6.  $(x + 3)^2 = 36$   $x = 3, x = -9$

7.  $-(x + 3)^2 + 4 = 0$   $x = -1, x = -5$

8.  $7(x - 6)^2 = 105$   $x = 6 \pm \sqrt{15}$

**Completing the Square Technique:**

In order to complete the square for the equation  $2x^2 - 20x + 5 = 0$ :

*Step 1: Factor the coefficient of the  $x^2$  out of both the  $x^2$  and  $x$  terms.*

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

*Step 2: Add one-half of the coefficient on  $x$  squared inside the parentheses; then subtract the value you added inside the parentheses times the coefficient in front of the parentheses to maintain equality.*

$$\left(\frac{b}{2}\right)^2 = \left(\frac{-10}{2}\right)^2 = (-5)^2 = 25 \text{ which gives } 2(x^2 - 10x + 25) - 50 + 5 = 0$$

*Step 3: Factor into a perfect square binomial and solve with the square root technique*

$$2(x - 5)^2 - 45 = 0 \text{ gives } (x - 5)^2 = 22.5 \text{ gives } x - 5 = \pm \sqrt{22.5} \text{ gives } x = 5 \pm \sqrt{22.5}$$

*or approximate solutions of  $x = 9.743, x = 0.257$*

**Use the technique of completing the square to solve the following equations:**

9.  $x^2 - 2x - 15 = 0$   $x = 5, x = -3$

10.  $x^2 + 4x - 5 = 0$   $x = 1, x = -5$

11.  $x^2 - x - 20 = 0$   $x = 5, x = -4$

12.  $x^2 - 4x = 12$   $x = 6, x = -2$

13.  $x^2 + 2x = 5$   $x = -1 \pm \sqrt{6}$

14.  $2x^2 + 4x = 1$   $x = -1 \pm \frac{\sqrt{6}}{2}$

15.  $3x^2 + 9x + 10 = 0$   $x = -\frac{3}{2} \pm \frac{i\sqrt{39}}{6}$

16.  $4x^2 - 20x = -6$   $x = \frac{5}{2} \pm \frac{\sqrt{19}}{2}$