

Solve each equation for x:

1. $x^2 = 169$

2. $x^2 - 625 = 0$

3. $81x^2 = 25$

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

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

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

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

8. $7(x - 6)^2 = 105$

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. $x^2 - 2x - 15 = 0$

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

11. $x^2 - x - 20 = 0$

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

13. $x^2 + 2x = 5$

14. $2x^2 + 4x = 1$

15. $3x^2 + 9x + 10 = 0$

16. $4x^2 - 20x = -6$