

Solve – by Completing the Square

- Procedure:**
1. Make sure $a = 1$
 2. Put variables on one side, number on the other side
 3. Take $\frac{1}{2}$ linear term and square
 4. Add that result to both sides
 5. Factor (use $\frac{1}{2}$ linear term)
 6. Solve resulting equation using $x^2 = n$ Method

Example Solve by completing the square. $x^2 - 6x + 2 = 0$

1. $a = 1$
2. $x^2 - 6x = -2$
3. $\frac{1}{2}$ of 6 is 3, square is 9
4. $x^2 - 6x + 9 = -2 + 9$
5. $(x - 3)^2 = 7$
 $x - 3 = \pm\sqrt{7}$
 $x = \pm\sqrt{7} + 3$

***Hint- If the coefficient of the quadratic term is not 1 or if b is an odd number , completing the square is typically not the best option to solve an equation.**

Solve:

1. $x^2 + 6x + 1 = 0$

2. $x^2 - 8x - 6 = 0$

3. $x^2 - 4x = 10$

4. $x^2 - 6x = 8$

5. $x^2 + 2x = 20$

6. $x^2 + 6y = 6$

7. $x^2 + 10x + 1 = 0$

8. $t^2 - 8t + 4 = 0$

9. $x^2 - 4x + 4 = 0$

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

11. $2x^2 + 8x - 12 = 0$

12. $x^2 + 3x = -1$