

Name: _____

Sec. 10.6: Solve Quadratic Equations by the Quadratic Formula

Factoring can be a great method for solving quadratic equations. Not all quadratics can be factored, however, at least not with _____ values of a , b , and c . For example:

$$x^2 + 8x + 12 = 0 \text{ factors very nicely into } (x + 2)(x + 6) = 0, \text{ but}$$

$$x^2 + 8x + 17 \text{ does not factor.}$$

When all else fails, we can always use the _____ to solve for x .

Quadratic formula: for $ax^2 + bx + c = 0$,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Tips for solving quadratics using the quadratic formula:

- Remember the quadratic should always be set equal to ____.
- Be careful with _____.
- Remember that you will typically end up with ____ solutions (although there can be 1 or none) due to the \pm operation in the formula.
- Pay attention to directions in terms of whether your answer should be an _____ answer (which might include a fraction or a radical) or a _____ rounded to a given number of decimal places.

Examples

Solve each equation by using the quadratic formula. Give exact answers.

1. $2x^2 - 5x - 133 = 0$

2. $6y^2 + 2y - 1 = 0$

3. $2q^2 + 8q = -8$

Solve each equation by using the quadratic formula. Round your answers to the nearest thousandth, if needed.

4. $-5v^2 + 2v + 127 = -8$

5. $-4g^2 = -17 + 8g$

6. $12m^2 - 19 = 5m + 10m^2$

Sec. 10.6 Practice Problems

Solve each equation with the quadratic formula. Give exact answers.

1) $-6a^2 + 24 = 0$

2) $-x^2 - 11x + 102 = 0$

3) $6v^2 + 7v - 10 = 0$

4) $-2k^2 + 7k + 4 = 0$

5) $3x^2 + 12x - 10 = 6$

6) $-4n^2 + 128 = 7$

7) $-8b^2 = -9$

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

$$9) 4x^2 = 25$$

$$10) 3m^2 - 108 = 0$$

Solve each equation with the quadratic formula. Round your answers to the nearest thousandth, as needed.

$$11) -m^2 = -117 - 4m$$

$$12) -4p^2 = -9 - 9p$$

$$13) 2x^2 + 11x = 6$$

$$14) 3x^2 = -7x + 20$$

$$15) -5a^2 - 5a = -6$$

$$16) -12n^2 = -2n + 6$$

Answers to Sec. 10.6 Practice Problems

1) $\{-2, 2\}$

2) $\{-17, 6\}$

3) $\left\{\frac{5}{6}, -2\right\}$

4) $\left\{-\frac{1}{2}, 4\right\}$

5) $\left\{\frac{-6 + 2\sqrt{21}}{3}, \frac{-6 - 2\sqrt{21}}{3}\right\}$

6) $\left\{-5\frac{1}{2}, 5\frac{1}{2}\right\}$

7) $\left\{-\frac{3\sqrt{2}}{4}, \frac{3\sqrt{2}}{4}\right\}$

8) $\{4 - 2\sqrt{6}, 4 + 2\sqrt{6}\}$

9) $\left\{2\frac{1}{2}, -2\frac{1}{2}\right\}$

10) $\{6, -6\}$

11) $\{-9, 13\}$

12) $\{-0.75, 3\}$

13) $\{0.5, -6\}$

14) $\{1.667, -4\}$

15) $\{-1.704, 0.704\}$

16) No solution.