

## Solving Quadratic Equations and Inequalities

**Question 1.** Solve the following quadratic equations by factoring.

- a)  $x^2 + 3x - 4 = 0$
- b)  $x^2 + 3x = 0$
- c)  $2x^2 - 7x + 3 = 0$
- d)  $8x^2 + 10x + 3 = 0$
- e)  $x^2 - 4x + 4 = 0$

**Question 2.** Solve the following quadratic equations by using square roots.

- a)  $x^2 - 16 = 0$
- b)  $x^2 - 2 = 2$
- c)  $3x^2 - 100 = 25 - 2x^2$
- d)  $x^2 - 4 = 2$
- e)  $3 - 2x^2 = x^2 + 3$

**Question 3.** Solve the following quadratic equations by completing the square.

- a)  $x^2 - 4x = 0$
- b)  $x^2 + 2x + 1 = 0$
- c)  $x^2 + 6x = 0$
- d)  $3x^2 - 6x - 24 = 0$
- e)  $4x^2 - 2x = 2x + 3$

**Question 4.** Solve the following quadratic equations using the quadratic formula.

- a)  $x^2 - 3x + 2 = 0$
- b)  $x^2 + 5x = 2x$
- c)  $x^2 + 2x + 2 = -x^2 - x + 1$
- d)  $12x^2 + 5x = 2$
- e)  $2x^2 + 5x + 1 = 0$

**Question 5.** Find all of the solutions to the following equations.

- a)  $x^3 - x^2 + x - 1 = 0$
- b)  $x^4 - x^3 + x^2 - x = -2$
- c)  $2x^3 + 2x^2 = 2x + 2$
- d)  $3x^3 = 4x^2 + 13x + 6$
- e)  $x^4 - 10x^2 + 9 = 0$

**Question 6.** Solve the following quadratic inequalities.

- a)  $x^2 + x - 2 > 0$
- b)  $x^2 > 0$
- c)  $x^2 \leq 0$
- d)  $x^2 < 6 - x$
- e)  $x^2 + 5x \geq 15x$
- f)  $3x^2 - 4x + 1 \leq -3x^2 + 3x - 1$

*You can check your answers on page 279.*