Solving Quadratics Folding Notes Answer Key

Factoring

Steps to solving

1. Rewrite the equation in standard form, so that one side of the equation is equal to 0.
2. Factor the equation.
3. Set each factor equal to 0.
4. Solve each factor for the variable.

Example

$$x^2+4x+3=15$$
$$x^2+4x-12=0$$
$$(x-2)(x+6)=0$$
$$x-2=0 \text{ or } x+6=0$$
$$x=2 \text{ or } x=-6$$

When to use

Use the factoring method when a quadratic equation can be easily factored.

Types of Solutions Found

- √ Rational
- □ Irrational ?
- □ Complex

Completing the Square

Steps to solving

1. Rewrite the equation so that the constant value, *c*, of the equation is on the opposite side of the equation from the variables.
2. Identify the values for *a*, *b*, and *c*.
3. Complete the square by finding one-half of the value of *b*, square that value, and add the value to both sides of the equation.
4. Factor the resulting perfect square trinomial.
5. Take the square root of both sides of the equation.
6. Solve for *x*.

Example

$$x^2+4x+3=15$$
$$x^2+4x=12$$
$$x^2+4x+4=12+4$$
$$(x+2)^2=16$$
$$x+2=\pm\sqrt{16}$$
$$x=-2\pm4$$
$$x=2 \text{ or } -6$$

When to use

Completing the square can be used anytime. The procedure is easier if the value of *a* is equal to one.

Types of Solutions Found

- √ Rational
- √ Irrational
- √ Complex

Quadratic Formula

Steps to solving

1. Rewrite the equation in standard form, so that one side of the equation is equal to 0.
2. Identify the values for *a*, *b*, and *c*.
3. Substitute the values in the quadratic formula.
4. Simplify the equations.

Example

$$x^2+4x+3=15$$
$$x^2+4x-12=0$$
$$x=\frac{-4\pm\sqrt{4^2-4(1)(-12)}}{2(1)}$$
$$x=\frac{-4\pm\sqrt{64}}{2}$$
$$x=\frac{-4\pm8}{2}$$
$$x=-6 \text{ or } 2$$

When to use

Use the quadratic formula anytime, especially when the equation does not factor.

Types of Solutions Found

- √ Rational
- √ Irrational
- √ Complex

Key points to remember

Remember to set the equation equal to 0.

Be certain the equation is factorable.

Factoring

Key points to remember

Rewrite the equation with the constant on the opposite side of the variables.

Remember to take half of the middle term and square it.

Remember to add the value to both sides.

Completing the Square

Key points to remember

Substitute for *a*, *b*, and *c* correctly.

Remember the first term of the quadratic formula is the "opposite of *b*."

Quadratic Formula