Objectives:

- Solve Quadratic Equations using the Square-Root Property.
- Solve Quadratic Equations using the Quadratic Formula.
- Solve equations that are quadratic in form (using substitution).

Square Root Property

Solving Quadratic Equations Using the Square Root Property:

Step 1: Isolate the expression containing the square term.

Step 2: Use the Square Root Property: if $x^2 = p$, then $x = \pm\sqrt{p}$

**don't forget the $\pm$ symbol!

Step 3: Solve for the variable if necessary.

Step 4: Verify your solution.

Examples: Solve using the Square Root Property.

A) $z^2 - 24 = 0$

B) $z^2 + 16 = -4$

C) $(a - 2)^2 + 12 = 0$

The Quadratic Formula

The Quadratic Formula:

Given an equation of the form $ax^2 + bx + c = 0$,

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

To solve using the formula:

Step 1: Write the equation in standard form and identify "a", "b", and "c".

Step 2: Substitute the values of a, b, and c into the formula.

Step 3: Simplify and verify your solutions.

Examples: Solve using the Quadratic Formula.

D) $2x^2 + 11x + 15 = 0$

E) $y^2 - 2 = -4y$

Examples: Solve using the Quadratic Formula.

F) $16k + \frac{9}{k} = -24$

G) $m^2 + m + 2 = 0$

Quadratic in Form (look quadratic)

Solving Equations That Are Quadratic in Form:

Step 1: Determine the appropriate substitution and write the equation in the form $au^2 + bu + c = 0$

Step 2: Solve the equation (using any method).

Step 3: Solve for the variable in the original equation using the value of u found in step 2. (Substitute your values back into the original substitution – you know u, now use that to find x.)

Step 4: Verify all of your solutions.

Examples: Solve using the Quadratic in form Method.

H) $x^4 - x^2 - 6 = 0$

Examples: Solve using the Quadratic in form Method.

1) $(z^2 + 3)^2 - 2(z^2 + 3) - 8 = 0$

Examples: Solve using the Quadratic in form Method.

J) $2x - 5\sqrt{x} + 2 = 0$

Remember Factoring to solve!

Sometimes it is easiest to solve by factoring.
Here is an example:

$$a^2 - 2a - 8 = 0$$

Objectives:

- Solve Quadratic Equations using the Square-Root Property.
- Solve Quadratic Equations using the Quadratic Formula.
- Solve equations that are quadratic in form (using substitution).

Homework:

Pg. 634: #'s 11-27 odd, 39-47 odd, 48, 51, 42, 65, 69 (19 problems)

on 47 & 48 Factor and on 51 & 52 use the Square Root Property

AND

Pg. 644: #'s 9-27 odd (10 problems)