

Notes WS 5.11 B - Solving Linear Quadratic Systems using the Quadratic Formula

Remember how to simplify radicals?

To simplify a radical, factor the expression under the radical sign to its prime factors. For every pair of like factors, bring out one of the factors. Multiply whatever is outside the sign, then multiply whatever is inside the sign. Remember that for each pair, you "bring out" only one of the numbers.

$$\sqrt{4} = 2 \text{ because } 2 \text{ is a factor used twice } (2 \times 2 = 4). \quad \sqrt{9} = 3 \text{ because } 3 \text{ is a factor used twice } (3 \times 3 = 9)$$

Examples: $\sqrt{28}$

$$\begin{array}{c} 7 \ 4 \\ 7 \ (2 \ 2) \\ 2\sqrt{7} \end{array}$$

$\sqrt{54}$

$$\begin{array}{c} 9 \ 6 \\ (3 \ 3) \ 3 \ 2 \\ 3\sqrt{2 \times 3} = 3\sqrt{6} \end{array}$$

$\sqrt{150}$

$$\begin{array}{c} 15 \ 10 \\ 3 \ (5) \ 2 \ (5) \\ 5\sqrt{3 \times 2} = 5\sqrt{6} \end{array}$$

$\sqrt{720}$

$$\begin{array}{c} 72 \ 10 \\ 9 \ 8 \ 2 \ 5 \\ (3 \ 3) \ (2 \ 2) \ (2 \ 2) \ 5 \end{array}$$

Simplify completely:

- | | | | | |
|---------------------------------|----------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| 1. $\sqrt{27}$
$3\sqrt{3}$ | 2. $\sqrt{32}$
$4\sqrt{2}$ | 3. $\sqrt{50}$
$5\sqrt{2}$ | 4. $\sqrt{80}$
$4\sqrt{5}$ | 5. $\sqrt{72}$
$6\sqrt{2}$ |
| 6. $\sqrt{120}$
$2\sqrt{30}$ | 7. $\sqrt{68}$
$2\sqrt{17}$ | 8. $\sqrt{200}$
$10\sqrt{2}$ | 9. $\sqrt{180}$
$6\sqrt{5}$ | 10. $\sqrt{275}$
$5\sqrt{11}$ |
| 11. $3\sqrt{12}$
$6\sqrt{3}$ | 12. $5\sqrt{48}$
$20\sqrt{3}$ | 13. $7\sqrt{76}$
$14\sqrt{19}$ | 14. $-8\sqrt{54}$
$-24\sqrt{6}$ | 15. $5\sqrt{84}$
$10\sqrt{21}$ |

Remember the Quadratic Formula?

One of the methods for solving a quadratic equation ($ax^2 + bx + c = 0$) is using the **quadratic formula**:

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

This method works for **every** quadratic equation!

To use the quadratic formula the equation must be in standard form: $ax^2 + bx + c = 0$

When to use the quadratic formula...

- When you can't factor the equation
- When you don't have a graphing calculator