

Simplifying Radicals

9th Grade

Pulling perfect squares out from under the root sign.

A radical simplifies when the number inside has a perfect square factor. Split it, take the root of the square, and leave the rest inside.

$$\sqrt{(ab)} = \sqrt{a} \times \sqrt{b}$$

$$\sqrt{50}$$

$$50 = 25 \times 2, \text{ and } \sqrt{25} = 5.$$

$$5\sqrt{2}$$

$$\sqrt{72}$$

$$72 = 36 \times 2.$$

$$6\sqrt{2}$$

$$\sqrt{x^6}$$

Halve the exponent for a square root.

$$x^3$$

$$3\sqrt{2} + 5\sqrt{2}$$

Like radicals add just like like terms.

$$8\sqrt{2}$$

THE COMMON MISTAKE

$$\times \sqrt{(9 + 16)} = 3 + 4$$

$$\checkmark \sqrt{25} = 5$$

The rule works over multiplication and division, never over addition.

$\sqrt{2}$, $\sqrt{3}$ and $\sqrt{5}$ are irrational. Leaving them exact is more accurate than a rounded decimal.