

1.5 Solve Quadratic Equations by Finding Square Roots

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A number r is a **square root** of a number s if $r^2=s$. A positive number s has two square roots, written as \sqrt{s} and $-\sqrt{s}$.

For example, because $3^2=9$ and $(-3)^2=9$, the two square roots of 9 are $\sqrt{9} = 3$ and $-\sqrt{9} = -3$. The positive square root of a number is also called the **principle square root**.

The expression \sqrt{s} is called a **radical**. The symbol $\sqrt{\quad}$ is a radical sign, and the number s beneath the radical is the **radicand** of the expression.

Product Property	$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$	$\sqrt{18} = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$
Quotient Property	$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$	$\sqrt{\frac{2}{25}} = \frac{\sqrt{2}}{\sqrt{25}} = \frac{\sqrt{2}}{5}$

***no perfect square under a radical other than 1**

***no radical in a denominator**

Conjugate:	$a+\sqrt{b}$ and $a-\sqrt{b}$
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Solve a Quadratic Equation x^2

$3x^2+5=41$	Subtract 5
$3x^2=36$	Divide by 3
$x^2=12$	Square root
$x=\pm\sqrt{12}$	Simplify radical
$x=\pm 2\sqrt{3}$	