Introduction to Solving Radical Equations

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When solving quadratics, we often needed to use square roots

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We will look now, equations that have x under the square root: $\sqrt{x}$

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Example

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Example

Find the solutions of:

$$x + 3 = 5$$

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Example

Find the solutions of:

$$x + 3 = 5$$
$$\Leftrightarrow$$

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Example

Find the solutions of:

$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3{-}3 = 5{-}3$$

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Example

Find the solutions of:
$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3 {-} 3 = 5 {-} 3$$
$$x = 2$$

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Example   Operation

Find the solutions of:

$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3 - 3 = 5 - 3$$
$$x = 2$$

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Example	Operation	Undo

Find the solutions of:

$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3 - 3 = 5 - 3$$
$$x = 2$$

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Example	Operation	Undo
Find the solutions of:	Addition	

$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3 - 3 = 5 - 3$$
$$x = 2$$

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction

$$x + 3 = 5$$
$$\Leftrightarrow$$
$$x + 3 - 3 = 5 - 3$$
$$x = 2$$

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Example	Operation	Undo
	Addition	Subtraction

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$\quad x - 3 = 5$		

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction

$$x - 3 = 5$$
$$\Leftrightarrow$$

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction

$$x - 3 = 5$$
$$\Leftrightarrow$$
$$x - 3 + 3 = 5 + 3$$

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction

$$x - 3 = 5$$
$$\Leftrightarrow$$
$$x - 3 + 3 = 5 + 3$$
$$x = 8$$

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	

$$\Leftrightarrow$$
$$x - 3 + 3 = 5 + 3$$
$$x = 8$$

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$		
$x - 3 + 3 = 5 + 3$		
$x = 8$		

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	
$x - 3 + 3 = 5 + 3$		
$x = 8$		

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$		
$x = 8$		

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Example

Find the solutions of:

$$x - 3 = 5$$

$$\Leftrightarrow$$

$$x - 3 + 3 = 5 + 3$$

$$x = 8$$

Operation	Undo
Addition	Subtraction
Subtraction	Addition
Multiplication	Division
Division	

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$	Division	Multiplication
$x = 8$		

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$	Division	Multiplication
$x = 8$	Square	

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$	Division	Multiplication
$x = 8$	Square	Square Root

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Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$	Division	Multiplication
$x = 8$	Square	Square Root
	Square Root	

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Example	Operation	Undo
Find the solutions of:	Addition	Subtraction
$x - 3 = 5$	Subtraction	Addition
$\Leftrightarrow$	Multiplication	Division
$x - 3 + 3 = 5 + 3$	Division	Multiplication
$x = 8$	Square	Square Root
	Square Root	Square