

Warm Up:

conjugate pairs



Prove $i^3(i+1)(i-1) = 2i$

$i^3(-2) = 2i$

$-2i^3 = 2i$

$-2(-i) = 2i$

$2i = 2i \checkmark$

★ Remember: In Algebra, prove means to show both sides are equal by changing only one side

$(i+1)(i-1)$

$i^2 - \cancel{i+i} - 1$

$-1-1$

-2

i^3

$-i$

i^2

-1

Radical Equations

Example:

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

$$3x+5 = 4$$

$$3x = -1$$

$$x = \left\{ -\frac{1}{3} \right\}$$

Procedure to solve a radical equation.

- 1) Isolate the radical
- 2) Square both sides of the equation
- 3) Solve for all values of x
- 4) Check both answers and name any **extraneous roots**
- 5) State the **solution set**

Roots that don't check

$-\frac{1}{3} \neq x$	✓
$\sqrt{3x+5}$	$-\frac{1}{3}$
■	2

More Examples:

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

$$4 - \sqrt{2 \cdot 7 - 5}$$

$$\begin{aligned} \sqrt{x+1} + 5 &= 0 \\ \sqrt{x+1} &= (-5)^2 \\ x+1 &= 25 \\ x &= 24 \end{aligned}$$

$$\begin{aligned} \sqrt{24+1} + 5 &= 0 \\ 5+5 &\neq 0 \\ \{ \} \end{aligned}$$

Solve algebraically for x:

$$\begin{aligned} 4 - \sqrt{2x-5} &= 1 \\ -4 & \quad -4 \\ \hline (-\sqrt{2x-5})^2 &= (-3)^2 \\ 2x-5 &= 9 \\ 2x &= 14 \\ x &= \{7\} \end{aligned}$$

$-\frac{1}{3}$
2
1

$$\begin{aligned} \sqrt{3x-8} + 4 &= 11 \\ \sqrt{3x-8} &= 7^2 \\ 3x-8 &= 49 \\ 3x &= 57 \\ \{19\} & \quad x = 19 \end{aligned}$$

EXIT TICKET



- Why are some solutions to radical equations extraneous?
- Why is it advantageous to isolate the radical?

Work in groups to complete the extra radical equation
practice

Homework: p. 112-113 #12, 13, 15, 16, 32, 41

Developing Skills

In 3–38, solve each equation for the variable, check, and write the solution set.

12. $\sqrt{5+a} = 7$

13. $3 - \sqrt{y} = 1$

15. $3 - \sqrt{2x+5} = 0$

16. $8 + \sqrt{2x-1} = 15$

32. $2 + \sqrt[3]{3b-2} = 6$

Applying Skills

41. In $\triangle ABC$, $AB = \sqrt{7x+5}$, $BC = \sqrt{5x+15}$, and $AC = \sqrt{2x}$.

- If $AB = BC$, find the length of each side of the triangle.
- Express the perimeter of the triangle in simplest radical form.