Objectives:

- Solve radical equations containing one radical.
- Solve radical equations containing two radicals.
- Solve for a variable in a radical equation.

Lesson 7.7: Solving Radical Equations

To solve an equation with a single radical term:

Step 1: Isolate the radical. (Get it by itself on one side of the equation – *everything* else goes to the other side.)

Step 2: Raise both sides of the equation to the power of the index. (If you have more than one term on the non-radical side, you may need to rewrite and distribute to simplify that side.) This should eliminate the radical.

Step 3: Solve the equation that results (find the value for the variable).

Step 4: CHECK YOUR ANSWERS! When we solve radicals that have even indices, we often get what we refer to as *"extraneous solutions"*, or solutions that appear to be valid, but that do not work in the original equation.

Lesson 7.7: Solving Radical Equations

Examples: Solve the following equations.

a.) $\sqrt{4x+1} = 5$

b.) $\sqrt{5x+6} - 3 = -2$

Examples: Solve the following equations.

c.) $\sqrt{3x-5}+8=3$

d.) $\sqrt{3x-11}=x-5$

Examples: Solve the following equations.

e.) $\sqrt[3]{2x+3}+5=8$

f.) $(2y-1)^{1/2}-2=3$

Lesson 7.7: Solving Radical Equations

Solving a radical equation containing two terms:

Step 1: Isolate one of the radicals. (Get it by itself on one side of the equation – *everything* else goes to the other side.)

Step 2: Raise both sides of the equation to the power of the index. (If you have more than one term on the non-radical side, you may need to rewrite and distribute to simplify that side.) This should eliminate one or both radicals.

Step 3: If a radical still remains, follow the steps we used to solve equations with just one radical. Solve the equation that results (find the value for the variable).

Step 4: CHECK YOUR ANSWERS! Remember we may get extraneous solutions.

Examples: Solve the following equations.

g.) $\sqrt[3]{a^2 - 3a + 5} = \sqrt[3]{2a^2 - 6a - 23}$

Lesson 7.7: Solving Radical Equations

Examples: Solve the following equations.

h.) $\sqrt{x+5} - \sqrt{x} = 1$

Example i.): Solve the following equations.

Given the formula $r = \sqrt{\frac{3V}{\pi h}}$ where r is the radius of a cone, V is the volume, and h is the height.

a) Solve the equation for h.

Example i.): Solve the following equations.

Given the formula $r = \sqrt{\frac{3V}{\pi h}}$ where r is the radius of a cone, V is the volume, and h is the height.

b) Find h when $r = 3$cm and $V = 18.85$ cubic cm. (Plug values in.)

Objectives:

- Solve radical equations containing one radical.
- Solve radical equations containing two radicals.
- Solve for a variable in a radical equation.

Can you?

Homework:

Pg. 587: # 7, 13, 17, 23, 29, 37, 41, 45, 51, 53, 55, 59, 61, 77, 81, 85, 87

(17 problems)