

Algebra 1

Chapter 10

Section 10-4

Review: Quadratic Equations

$$\begin{aligned} \frac{5}{7}x^2 - 11 &= 24 \\ &+11 \quad +11 \\ \frac{5}{7}x^2 &= 35 \\ \frac{5}{7}x^2 &= 35 \cdot \frac{7}{5} \\ x^2 &= 49 \\ \sqrt{x^2} &= \sqrt{49} \\ x &= 7, -7 \end{aligned}$$

Steps:

* Isolate x^2 term
→ Isolate x^2

* cancel exponent ($\sqrt{\quad}$)

Radical Equations

$$\sqrt{2-x} + 7 = 11$$

$$(\sqrt{2-x})^2 = (4)^2$$

$$2-x = 16$$

$$-x = 14$$

$$x = -14$$

check: $\sqrt{2-(-14)} + 7 \stackrel{?}{=} 11$

$$\sqrt{16} + 7 = 11$$

$$\sqrt{4+7} = 11$$

Steps:

* Isolate $\sqrt{\quad}$ * Cancel $\sqrt{\quad}$ (with exponent 2)* Isolate x

Solving Radical Equations

$$\sqrt{x} - 4 = 3$$

$$(\sqrt{x})^2 = (7)^2$$

$$x = 49$$

$$(\sqrt{x-9})^2 = (6)^2$$

$$x-9 = 36$$

$$x = 45$$

Solving Radical Equations

Always check your solutions!

$$\begin{aligned} (\sqrt{x^2 + 4})^2 &= (\sqrt{5x})^2 \\ x^2 + 4 &= 5x \\ -5x \quad -5x \\ x^2 - 5x + 4 &= 0 \\ (x-4)(x-1) &= 0 \\ x-4=0 & \quad x-1=0 \\ \checkmark x=4 & \quad \checkmark x=1 \end{aligned}$$

Solving Radical Equations

Always check your solutions!

$$\begin{aligned} \sqrt{3-11} &= \sqrt{-8} \\ (\sqrt{x-11})^2 &= (\sqrt{1-3x})^2 \\ x-11 &= 1-3x \\ +3x+11 \quad +11 \quad +3x \\ 4x &= 12 \\ \frac{4}{4}x &= \frac{12}{4} \\ x &= 3 \\ &\rightarrow \text{No solution} \end{aligned}$$

Solving Radical Equations:

Always check your solutions!

$$\sqrt{x} + 6 = 4$$

$$\begin{array}{r} -6 \quad -6 \\ (\sqrt{x})^2 = (2)^2 \end{array}$$

$$x = 4$$

$$\sqrt{4} + 6 = 4$$

$$2 + 6 \neq 4$$

No solution

$$(20)^2 = (\sqrt{x+1})^2$$

$$400 = x + 1$$

$$399 = x$$

$$(\sqrt{4s})^2 = (3\sqrt{s-5})^2$$

$$4s = 9(s-5)$$

$$4s = 9s - 45$$

$$-9s \quad -9s$$

$$-5s = -45$$

$$\frac{-5s}{-5} = \frac{-45}{-5}$$

$$s = 9$$

$$\sqrt{4 \cdot 9} = 3\sqrt{9-5}$$

$$6 = 3 \cdot 2$$

Solving Radical Equations:

Always check your solutions!

$$(\sqrt{x^2 + 225})^2 = (17)^2$$

$$x^2 + 225 = 289$$

$$\begin{array}{r} -225 \quad -225 \end{array}$$

$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8, -8$$

$$(\sqrt{13x})^2 = (\sqrt{x^2 + 30})^2$$

$$13x = x^2 + 30$$

$$\begin{array}{r} -13x \quad -13x \end{array}$$

$$0 = x^2 - 13x + 30$$

$$0 = (x-10)(x-3)$$

$$x-10=0 \quad x-3=0$$

$$x=10 \quad x=3$$

A circular balloon is being inflated for an experiment. The radius (r) of the balloon is approximated by the equation:

$$r = \sqrt{\frac{SA}{12.566}}$$

where SA is the surface area of the balloon. The desired radius of the balloon is 5 inches. Find the surface area of the balloon.

$$(5)^2 = \left(\sqrt{\frac{SA}{12.566}} \right)^2$$

$$12.566 \cdot 25 = \frac{SA}{12.566} \cdot 12.566$$

$$314.15 = SA$$