

Warm up

1. Simplify $-\sqrt{169}$

5. $7x^2 + 30 = 9$

2. Simplify $\sqrt{64}$

3. $\frac{6 \pm 4\sqrt{2}}{-1}$

6. $7x^2 - 63 = 0$

4. Round to the hundredth $\sqrt{13}$

Homework Questions?

49. ERROR ANALYSIS Find and correct the error at the right.

$x^2 + 36 = 0$
 ~~$\sqrt{x^2} = \sqrt{-36}$~~
 ~~$x = -6$~~

No
soln

52) $2x^2 - 4 = 10$

$$\begin{array}{r} +4 \quad +4 \\ 2x^2 = 14 \\ \hline x^2 = \frac{14}{2} \end{array}$$

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

$$x = \pm 2.65$$

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

9.3 Simplifying Radicals

Goals: • Simplify radical expressions.

EQ: What does simplest form mean?

② LAST UNIT/Experience Exponents	① CURRENT UNIT Quadratic Equations	③ NEXT UNIT/Experience Factoring
⑧ Student Activities or Assignments 1. Solving Quadratic Worksheet 2. 9.1(24-76even) 3. ...	⑤ UNIT MAP 	
⑦ UNIT QUIZ 1. How do you solve a quadratic equation by using square roots? 2. How do you simplify radical expressions? 3. What steps are necessary to graph a quadratic equation? 4. How is the quadratic formula used to solve a quadratic equation? 5. How is the discriminant found and what information does it tell you?	⑥ UNIT RELATIONSHIPS Solve Simplify Graph Compare.	

Vocabulary

Simplest form of a radical expression:

1) $\sqrt{\text{No Perfect Square}}$ ex: $\text{No } \sqrt{36}$
 $\sqrt{36} = 6$

2) $\sqrt{\text{No Fraction}}$ ex: $\text{No } \sqrt{\frac{5}{16}}$
 $\frac{\sqrt{5}}{\sqrt{16}} = \left(\frac{\sqrt{5}}{4}\right)$

3) $\sqrt{\text{Denominator}}$

Perfect Squares

$1^2 =$	1	64	
$2^2 =$	4	81	225
$3^2 =$	9	100	256
	16	121	
	25	144	
	36	169	
	49	196	

PRODUCT PROPERTY OF RADICALS

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b} \text{ where } a \geq 0 \text{ and } b \geq 0$$

$$\sqrt{8} = \sqrt{4}\sqrt{2} = \boxed{2\sqrt{2}}$$

QUOTIENT PROPERTY OF RADICALS

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \text{ where } a \geq 0 \text{ and } b > 0$$

Example 1: Simplify with the Product PropertySimplify $\sqrt{80}$.

*Look for Perfect Squares

$$\begin{aligned}
 &= \sqrt{4}\sqrt{20} \\
 &= 2\sqrt{4}\sqrt{5} \\
 &= 2 \cdot 2 \cdot \sqrt{5} \\
 &= \boxed{4\sqrt{5}}
 \end{aligned}$$

$$\begin{aligned}
 &\sqrt{80} \\
 &= \sqrt{16}\sqrt{5} \\
 &= \boxed{4\sqrt{5}}
 \end{aligned}$$

Example 2: Simplify with the Quotient Property

$$\text{Simplify } \sqrt{\frac{20}{45}} = \frac{\sqrt{20}}{\sqrt{45}} = \frac{\sqrt{4}\sqrt{5}}{\sqrt{9}\sqrt{5}}$$

$$= \frac{2\sqrt{5}}{3\sqrt{5}}$$

$$= \boxed{\frac{2}{3}}$$

$$\begin{aligned}
 \frac{\cancel{5}}{\cancel{5}} &= 1 \\
 \frac{\cancel{5}x}{\cancel{5}} &= x
 \end{aligned}$$

Example 3: Rationalize the Denominator

$$\begin{aligned} \text{Simplify } \sqrt{\frac{7}{48}} &= \frac{\sqrt{7}}{\sqrt{48}} = \frac{\sqrt{7}}{\sqrt{16}\sqrt{3}} = \frac{\sqrt{7} \cdot \sqrt{3}}{4\sqrt{3} \cdot \sqrt{3}} \\ &= \frac{\sqrt{21}}{4\sqrt{9}} = \frac{\sqrt{21}}{4 \cdot 3} = \frac{\sqrt{21}}{12} \end{aligned}$$

SIMPLEST FORM OF A RADICAL EXPRESSION

- No perfect square factors other than 1 are in the Radical.

$$\sqrt{75} \longrightarrow \sqrt{25 \cdot 3} \longrightarrow 5\sqrt{3}$$

- No Fraction are in the radicand.

$$\sqrt{\frac{3}{25}} \longrightarrow \frac{\sqrt{3}}{\sqrt{25}} \longrightarrow \frac{\sqrt{3}}{5}$$

- No radicals are in the Denominator of a fraction.

$$\frac{1}{\sqrt{3}} \longrightarrow \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} \longrightarrow \frac{\sqrt{3}}{3}$$

Try It Simplify the expression.

$$1) \sqrt{12} = \sqrt{4}\sqrt{3} \\ = \boxed{2\sqrt{3}}$$

$$2) \sqrt{108} = \sqrt{4}\sqrt{27} \\ = 2\sqrt{9}\sqrt{3} \\ = 2 \cdot 3 \cdot \sqrt{3} \\ = \boxed{6\sqrt{3}}$$

$$3) \sqrt{\frac{13}{36}} = \frac{\sqrt{13}}{\sqrt{36}} = \frac{\sqrt{13}}{6}$$

$$4) \sqrt{\frac{20}{64}} = \frac{\sqrt{20}}{\sqrt{64}} \\ = \frac{\sqrt{4}\sqrt{5}}{8} = \frac{2\sqrt{5}}{8} \\ = \frac{\sqrt{5}}{4}$$

$$5) \sqrt{\frac{8}{100}} = \frac{\sqrt{8}}{\sqrt{100}} \\ = \frac{\sqrt{4}\sqrt{2}}{10}$$

$$\frac{\sqrt{2}}{5} \quad \frac{2\sqrt{2}}{10} \\ = \frac{\sqrt{2}}{5}$$

$$6) \sqrt{\frac{90}{160}} = \frac{\sqrt{90}}{\sqrt{160}}$$

$$= \frac{\sqrt{9}\sqrt{10}}{\sqrt{16}\sqrt{10}}$$

$$= \frac{3\sqrt{10}}{4\sqrt{10}} = \frac{3}{4}$$

Homework

9.2 "Notes" wkst #1-18

& Finish Solving Equations wkst (p.90)

#2-20 even