

Algebra 9:

April -27 - May 1

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: Mrs. Hudson

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Zoom sessions: Monday and Wednesday at 10AM

Chapter 11: Rational and Irrational Numbers

Packet Overview

Date	Objective(s)	Page Number
Monday, April 27	Chapter 11-3 Continued: Be able to find the square roots of numbers that have rational square roots.	2-5
Tuesday, April 28	Chapter 11-4: Be able to simplify radicals and to find decimal approximations of the irrational square roots. Watch Video!	6-10
Wednesday, April 29	Chapter 11-4: Continued... Be able to simplify radicals and to find decimal approximations of the irrational square roots. Quiz Tomorrow on 11: 1-4	11-14
Thursday, April 30	Quiz on 11: 1-4 Chapter 11-5: Be able to find square roots of variable expressions and to use them to solve equations and problems.	15-16 17-18
Friday, May 1	Chapter 11-5 Continued... Be able to find square roots of variable expressions and to use them to solve equations and problems.	19-21

Additional Notes:

- ❖ **Materials:** Printed packet or notebook paper; pencils. (Calculators **ARE** needed).
 - **Note:** If you are using notebook paper, be sure to write the pages and numbers of the material.
 - **Example:** P. 6; #1) _____
- ❖ **Answers of odd problems are in the back of the book. Other answers will be provided at the end of each lesson.**
- ❖ **Quiz:** Located on pages 15-16. This should be taken *without* looking at previous work. No answers are provided for the quiz.

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

Algebra Unit: Chapter 11 Rational and Irrational Numbers

Unit Overview: Rational and Irrational Numbers

We are now starting Chapter 11, Rational and Irrational Numbers. In this chapter, you will:

- 1) Properties of Rational Numbers
- 2) Decimal Forms of Rational Numbers
- 3) Rational Square Roots
- 4) Irrational Square Roots
- 5) Square Roots of Variable Expressions
- 6) The Pythagorean Theorem
- 7) Multiplying, Dividing, and Simplifying Radicals
- 8) Adding and Subtracting Radicals
- 9) Multiplication of Binomials Containing Radicals
- 10) Simple Radical Equations

Monday, April 27

Lesson 11-3: Rational Square Roots

Objective: Be able to find the square roots of numbers that have rational square roots.

- Study the pages with notes and examples.
- Use these examples to help complete today's assignment.
- Page 513 Simplify:

P. 513

Review

(18) $\sqrt{\frac{324}{729}}$

① Can you reduce? No

②

$$\sqrt{\frac{324}{729}}$$

③ Make a list → $15^2 = 225$ too small
 $18^2 = 324$
 Hint: $2 \times 2 = 4$
 $20^2 = 400$
 $30^2 = 900$ ← 729
 $27^2 = 729$ is closer to this one.
 Hint: $7 \times 7 = 49$

Answer: $\sqrt{\frac{324}{729}} = \frac{18}{27}$ Reduce now $\frac{2}{3}$

$\frac{2}{3}$

Review

②⑥ $\pm \sqrt{\frac{92}{207}}$ ① Reduce? Yes

$\pm \sqrt{\frac{92}{207} \div 23} = \pm \sqrt{\frac{4}{9}}$

② $\pm \frac{\sqrt{4}}{\sqrt{9}}$

③ $\pm \frac{2}{3}$

New:

● ③④ $\sqrt{0.09} \rightarrow$ Hint $\sqrt{9} = 3$

\rightarrow Warning: A lot of people will use 0.03 as the answer, but $0.03 \times 0.03 = 0.0009$ 4 #'s after decimal

$$\begin{array}{r} 000 \\ 000 \\ \hline 00009 \end{array}$$

Did we start with $\sqrt{0.0009}$? No

● Answer:

$\boxed{0.3}$

③⑥ $-\sqrt{0.64} \rightarrow$ Hint $8^2 = 64$
↓
Answer: -0.8

③⑧ $\sqrt{2.25} \rightarrow$ HINT: $15^2 = 225$
Answer: 1.5 check $(\underline{1.5})(\underline{1.5}) = \underline{2.25}$
Two #s after decimal Two #s after decimal

④⑩ $\pm \sqrt{12.25} \rightarrow$ HINT $35^2 = 1225$
Answer: ± 3.5

- Homework: P. 513 Written Exercises #'s 17, 25, 33, 35, 37, 39
- Use a piece of paper or the boxes below.

17)	25)
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33)	35)
37)	39)

➤ Be sure to check your answers in the back of the book.

Tuesday, April 28

Algebra Unit: Rational and Irrational Numbers

Lesson 11-4: Irrational Square Roots

Objective: Be able to simplify radicals and to find decimal approximations of the irrational square roots.

- WATCH video on GOOGLE!
- Study the pages with notes and examples.
- Use these examples to help complete today's assignment.
- Page 522

11-4 Irrational Square Roots
P. 522

② $\sqrt{28} \rightarrow 5^2 = 25$
 $6^2 = 36$ $\sqrt{28}$ is between 5 and 6

estimate, 28 is closer to 36, so $\sqrt{28}$ is about 5.3(?)

calculator, 5.291502622...
Irrational

simplify, $\sqrt{28}$

$\begin{matrix} & \swarrow & \searrow \\ \textcircled{2} & \cdot & 14 \\ & \swarrow & \searrow \\ \textcircled{2} & \cdot & \textcircled{7} \end{matrix}$

$\sqrt{2 \cdot 2 \cdot 7}$

$\sqrt{2^2 \cdot 7}$

$\sqrt{2^2} \cdot \sqrt{7}$

$2\sqrt{7}$

④ $\sqrt{50}$ \longrightarrow $7^2 = 49$ so close!
 $8^2 = 64$

estimate ~ 7.1

calculator $7.071067812\dots$
"Good estimate"

simplify \longrightarrow $\sqrt{50}$
25
5 5

$$\sqrt{2 \cdot 5 \cdot 5}$$

$$\sqrt{2 \cdot 5^2}$$

$$\sqrt{2} \cdot \sqrt{5^2}$$

$$\boxed{5\sqrt{2}}$$

⑥ $\sqrt{24}$ $4^2 = 16$
 $5^2 = 25 \leftarrow \text{close}$

So, ~ 4.9 . Calculator $\rightarrow 4.8989...$

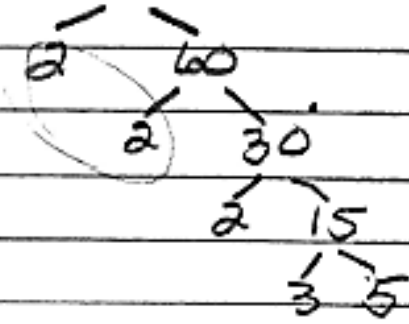
Simplify: $\sqrt{24} \rightarrow \sqrt{2^2 \cdot 2 \cdot 3}$
 $\begin{array}{c} 2 \quad 12 \\ \downarrow \downarrow \\ 2 \quad 6 \\ \downarrow \downarrow \\ 2 \quad 3 \end{array}$ $\sqrt{2^2} \cdot \sqrt{2 \cdot 3}$
 $\downarrow \quad \swarrow$
 $2 \sqrt{6}$

$2\sqrt{6}$

⑧ $\sqrt{120}$ $10^2 = 100$ $11^2 = 121$
 ~ 10.9

Calc. $\sim 10.9544...$

Simplify $\sqrt{120}$



$\sqrt{2^2 \cdot 2 \cdot 3 \cdot 5}$

$\sqrt{2^2} \cdot \sqrt{2 \cdot 3 \cdot 5}$

$2\sqrt{30}$

$$\textcircled{10} \quad 6\sqrt{108}$$

$$6\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}$$

$$6\sqrt{2^2 \cdot 3^2 \cdot 3}$$

$$6 \cdot \sqrt{2^2} \cdot \sqrt{3^2} \cdot \sqrt{3}$$

$$6 \cdot 2 \cdot 3 \cdot \sqrt{3}$$

$$\boxed{36\sqrt{3}}$$

$$108$$

$$\textcircled{2} \quad 54$$

$$\textcircled{3} \quad 27$$

$$\textcircled{3} \quad 9$$

$$\textcircled{3} \quad \textcircled{3}$$

$$\textcircled{12} \quad 9\sqrt{90}$$

$$9 \cdot \sqrt{2 \cdot 3^2 \cdot 5}$$

$$9 \cdot \sqrt{3^2} \cdot \sqrt{2 \cdot 5}$$

$$9 \cdot 3 \cdot \sqrt{10}$$

$$\boxed{27\sqrt{10}}$$

$$90$$

$$\textcircled{2} \quad 45$$

$$\textcircled{3} \quad 15$$

$$\textcircled{3} \quad 5$$

- I hope those examples are helpful.
- Homework: P. 522 Written Exercises #'s 1-11 odd
- Use a piece of paper or the boxes on the next page

1)	3)
5)	7)
9)	11)

➤ Check your ANSWERS!!!

Wednesday, April 29

Algebra Unit: Rational and Irrational Numbers

Lesson 11-4 Continued: Irrational Square Roots

Objective: Be able to simplify radicals and to find decimal approximations of the irrational square roots.

- Study the pages with notes and examples.
- Use these examples to help complete today's assignment.
- Page 523: Simplify.

16 $14\sqrt{75}$
 $\begin{array}{c} 3 \ 25 \\ \text{---} \\ 5 \ 5 \end{array}$

$$14 \cdot \sqrt{3 \cdot 5^2}$$

$$14 \cdot \sqrt{5^2} \cdot \sqrt{3}$$

$$14 \cdot 5 \cdot \sqrt{3}$$

$$\boxed{70\sqrt{3}}$$

18 $\sqrt{864}$
 $\begin{array}{c} 2 \ 432 \\ \text{---} \\ 2 \ 216 \\ \text{---} \\ 2 \ 108 \\ \text{---} \\ 2 \ 54 \\ \text{---} \\ 3 \ 27 \\ \text{---} \\ 3 \ 9 \\ \text{---} \\ 3 \end{array}$

$$\sqrt{2^2 \cdot 2^2 \cdot 2 \cdot 3^2 \cdot 3}$$

$$\sqrt{2^2} \cdot \sqrt{2^2} \cdot \sqrt{3^2} \cdot \sqrt{2 \cdot 3}$$

$$2 \cdot 2 \cdot 3 \cdot \sqrt{6}$$

$$\boxed{12\sqrt{6}}$$

20) $\sqrt[3]{160}$

$$\sqrt[3]{2^2 \cdot 2^2 \cdot 2 \cdot 5}$$

$$\sqrt[3]{2^2} \cdot \sqrt[3]{2^2} \cdot \sqrt[3]{2 \cdot 5}$$

$$2 \cdot 2 \cdot \sqrt{10}$$

$\boxed{12\sqrt{10}}$

22) $\sqrt{432}$

$$\sqrt{2^2 \cdot 2^2 \cdot 3^2 \cdot 3}$$

$$\sqrt{2^2} \cdot \sqrt{2^2} \cdot \sqrt{3^2} \cdot \sqrt{3}$$

$$2 \cdot 2 \cdot 3 \cdot \sqrt{3}$$

$\boxed{12\sqrt{3}}$

- Now it is your turn to give these a try. Take a breath. You can do it!
- Homework: P. 523 Written Exercises #'s 17 - 23 odd
- Use a piece of paper or the use the boxes below.

17)	19)
-----	-----

21)	23)
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- Now, the next questions are to review for tomorrow's quiz on 11:1 – 4
- P. 659-660 #'s 1, 5, 19, 31, 37, 39, 47, 49

1)	5)
19)	31)

37)	39)
47)	49)

➤ CHECK YOUR ANSWERS!!! Quiz tomorrow!

Thursday, April 30

Algebra Unit: Rational and Irrational Numbers

Quiz on 11: 1-4

Lesson: 11-5: Square Roots of Variable Expressions

Objective: Be able to find square roots of variable expressions and to use them to solve equations and problems.

- Remember, nothing but a pencil, paper (or this sheet), and a calculator should be out for the **QUIZ**.
- Be sure to **BOX** your answers.

<p>1) Use $<$, $>$, or $=$ to make the statement true</p> $-\frac{62}{21} \quad -2\frac{19}{20}$	<p>2) Arrange the group of numbers in order from least to greatest:</p> $-\frac{1}{2}, -\frac{1}{4}, -\frac{1}{3}$
<p>3) Change the fraction to a decimal:</p> $5\frac{3}{8}$	<p>4) Change the fraction to a decimal:</p> $-\frac{27}{40}$
<p>5) Change the decimal into a fraction:</p> 2.05	<p>6) Change the decimal into a fraction:</p> -0.17

Algebra 1: Rational and Irrational Numbers

April 27- May 1

For the remaining questions, simply. SHOW STEPS!!!
Your answers should NOT have decimals!!!

7) $\sqrt{289}$

8) $-\sqrt{484}$

9) $\sqrt{\frac{81}{196}}$

10) $\sqrt{0.04}$

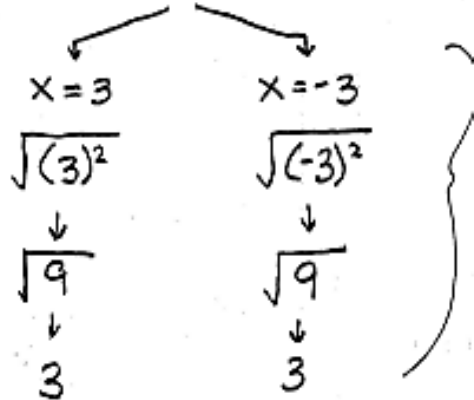
11) $\sqrt{\frac{242}{450}}$

12) $2\sqrt{52}$

- That is the end of the quiz.
- The notes and examples for today are on the next page.

11-5 Square Roots of Variable Expressions

Does $\sqrt{x^2} = x$ always?



So, they both came out positive.

$\sqrt{x^2} = x$ but $|x|$ ^{odd needs}
 but $\sqrt{x^4} = x^2$ ^{even doesn't need absolute value}

P. 526

② $\sqrt{100z^2}$

$\sqrt{10^2 z^2}$

$\sqrt{10^2} \sqrt{z^2}$

$10 |z|$

z^1 is odd

④ $\sqrt{32b^4}$



$\sqrt{2^2 \cdot 2^2 \cdot 2 \cdot b^2 \cdot b^2}$

$\sqrt{2^2} \cdot \sqrt{2^2} \cdot \sqrt{2} \cdot \sqrt{b^2} \cdot \sqrt{b^2}$

$2 \cdot 2 \cdot \sqrt{2} \cdot b \cdot b$

$4b^2\sqrt{2}$

⑥ $-\sqrt{64x^2}$

$-\sqrt{8^2 x^2}$

$-\sqrt{8^2} \cdot \sqrt{x^2}$

$-8|x|$

➤ Homework p. 526 Written Exercises 1, 3, 5, 7

1)	3)
5)	7)

➤ Check those answers!

Friday, May 1

Lesson: 11-5 Continued: Square Roots of Variable Expressions

Objective: Be able to find square roots of variable expressions and to use them to solve equations and problems.

- We are going to continue working on 11-5.
- Here are some review questions.

Examples: $\sqrt{16d^6}$

$$\sqrt{4^2} \cdot \sqrt{d^2} \cdot \sqrt{d^2} \cdot \sqrt{d^2}$$

$$4 \cdot d \cdot d \cdot d$$

$$4d^3 \leftarrow \text{odd}$$

so

$$\star 4|d^3|$$

and $\sqrt{16d^8}$

$$\sqrt{4^2} \cdot \sqrt{d^2} \cdot \sqrt{d^2} \cdot \sqrt{d^2} \cdot \sqrt{d^2}$$

$$4 \cdot d \cdot d \cdot d \cdot d$$

$$4d^4 \leftarrow \text{even}$$

\star No absolute value needed

P. 526

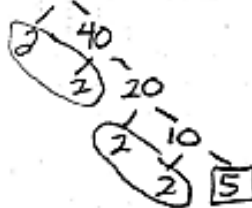
⑩ $\sqrt{49a^2b^2}$

$$\sqrt{7^2} \cdot \sqrt{a^2} \cdot \sqrt{b^2}$$

$$7|ab|$$

↕
 both
 have
 odd
 exponents

⑫ $\sqrt{80n^6}$



$$\sqrt{2^2 \cdot 2^2 \cdot 5 \cdot n^2 \cdot n^2 \cdot n^2}$$

$$\sqrt{2^2} \cdot \sqrt{2^2} \cdot \sqrt{5} \cdot \sqrt{n^2} \cdot \sqrt{n^2} \cdot \sqrt{n^2}$$

$$2 \cdot 2 \cdot \sqrt{5} \cdot n \cdot n \cdot n$$

4	n^3	$\sqrt{5}$
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$$\begin{aligned}
 (18) \quad & \pm \sqrt{\frac{256}{400s^{12}}} \rightarrow \text{Reduce} \rightarrow \pm \sqrt{\frac{256 \div 4}{400s^{12} \div 4}} = \sqrt{\frac{64}{100s^{12}}} = \\
 & \pm \frac{\sqrt{64}}{\sqrt{100 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2}} \\
 & = \frac{\sqrt{8^2}}{\sqrt{10^2 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2 \cdot s^2}} = \frac{8}{10 \cdot s \cdot s \cdot s \cdot s \cdot s \cdot s} \\
 & = \frac{8}{10s^6} = \frac{4}{5s^6}
 \end{aligned}$$

★ Hint $\sqrt{\quad}$ has an imaginary $\sqrt{\quad}$

$$\begin{array}{cccc}
 \text{So } \sqrt{x^2} & \sqrt{x^4} & \sqrt{x^6} & \sqrt{x^8} \\
 = |x| & x^2 & |x^3| & x^4
 \end{array}$$

Example $\sqrt{100x^{20}} \rightarrow 20 \div 2$ (ONLY on exponents)

$$10x^{10}$$

➤ Alright, the last assignment for this week is on the next page.

➤ P. 526 Written Exercises #'s 9 – 19 odd

9)	11)
13)	15)
17)	19)

- Check those answers and make corrections!
- HAVE A GREAT WEEKEND!!!