GreatHearts®

Algebra 9th:

May 11 - 15

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, May 11	Chapter 11-7: Be able to simplify products and quotients of radicals.	2-7
Tuesday, May 12	Chapter 11-7 Continued… Be able to simplify products and quotients of radicals.	8-10
Wednesday, May 13	Chapter 11-8: Be able to simplify sums and differences of radicals.	11-13
Thursday, May 14	Chapter 11-8 Continued… Be able to simplify sums and differences of radicals. **Minor Assessment tomorrow on 11: 7-8**	14-16
Friday, May 15	Chapter 11-7 & 11-8 Review… Be able to simplify products, quotients, sums, and differences of radicals. **Minor Assessment on 11: 7-8**	17-18 19-20

Additional Notes:

- **Materials:** Printed packet or notebook paper; pencils. (Calculators ARE NOT needed).
  - **Note:** If you are using notebook paper, be sure to write pages and numbers of 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.**
- **Minor Assessment:** Located on pages 19-20. 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

Monday, May 11

Lesson: 11-7: Multiplying, Dividing, and Simplifying Radicals

Objective: Be able to simplify products and quotients of radicals.

- Hello everyone!!!
- Turn to page 538 Written Exercises. I will show the EVENS and you can do the ODDS!

2) $4\sqrt{7} \cdot 2\sqrt{7}$ $4\sqrt{7}\ 2\sqrt{7}$ $4\ 2\ \sqrt{7}\ \sqrt{7}$ $8\ \sqrt{49}$ $8\ \sqrt{7^2}$ $8\ 7$ 56	1)

4) $\sqrt{5} \cdot \sqrt{5} \cdot \sqrt{9}$ $\sqrt{5} \cdot \sqrt{5} \cdot \sqrt{3^2}$ $\sqrt{5^2} \cdot \sqrt{3^2}$ $5 \cdot 3$ $\boxed{15}$	3)
6) $6\sqrt{2} \cdot \sqrt{5}$ $6 \sqrt{2} \cdot 1 \sqrt{5}$ $6 \cdot 1 \cdot \sqrt{2} \cdot \sqrt{5}$ $6 \sqrt{2 \cdot 5}$ $\boxed{6\sqrt{10}}$	5)
8) $\sqrt{5} \cdot \sqrt{20}$ $\sqrt{5 \; 20}$ $\sqrt{100}$ $\sqrt{10^2}$ $\boxed{10}$	7)

10) $\sqrt{7} \cdot \sqrt{35}$

$\sqrt{7\ 35}$ ★ Short cut

$\sqrt{7 \cdot 7 \cdot 5}$

$\sqrt{7^2 \cdot 5}$

$\sqrt{7^2}\ \sqrt{5}$

$7\sqrt{5}$

9)

12) $9\sqrt{242}$

$9\ \sqrt{2\ 121}$

$9\ \sqrt{2\ 11^2}$

$9 \cdot \sqrt{11^2}\ \sqrt{2}$

$9 \cdot 11 \cdot \sqrt{2}$

$99\sqrt{2}$

11)

14) $\sqrt{\frac{4}{9}} \cdot \sqrt{\frac{18}{4}}$

$\sqrt{\frac{\cancel{4}^{1}}{\cancel{9}_{1}} \cdot \frac{\cancel{18}^{2}}{\cancel{4}_{1}}}$

$\sqrt{\frac{1}{1} \cdot \frac{2}{1}}$

$\sqrt{\frac{2}{1}} = \frac{\sqrt{2}}{\sqrt{1}} = \frac{\sqrt{2}}{1}$

$\sqrt{2}$

13)

16) $\sqrt{\frac{7}{3}} \cdot \sqrt{\frac{3}{28}}$

$\sqrt{\frac{7}{3} \cdot \frac{3}{28}}$ Reduce

$\sqrt{\frac{1}{1} \cdot \frac{1}{4}}$

$\frac{\sqrt{1}}{\sqrt{4}}$

$\frac{1}{2}$

15)

18) $\sqrt{\frac{4}{5}} \cdot \sqrt{\frac{10}{36}}$

$\sqrt{\frac{4}{5} \cdot \frac{10}{36}}$

$\frac{\sqrt{2}}{\sqrt{9}}$

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

17)

20) $\sqrt{2\frac{2}{5}} \cdot \sqrt{1\frac{2}{3}}$

$\sqrt{\frac{12}{5}} \cdot \sqrt{\frac{5}{3}}$

$\sqrt{\frac{12^{4} \cdot 5^{1}}{5^{1} \cdot 3^{1}}}$

$\sqrt{4}$

2

19)

22) $\sqrt{\frac{15}{11}} \cdot \sqrt{\frac{1}{3}}$

$\sqrt{\frac{15^{5}}{11} \cdot \frac{1}{3^{1}}}$

$\sqrt{\frac{5}{11}}$

New rule

No $\sqrt{\ }$ in denominator

$\frac{\sqrt{5}}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}}$

Multiply them both by $\sqrt{11}$

$\frac{\sqrt{5\ 11}}{\sqrt{11\ 11}}$

Now you can take $\sqrt{11^2}$

$\frac{\sqrt{55}}{11}$

21)

24) $\frac{5\sqrt{48}}{\sqrt{39}}$

$\frac{5}{1}\sqrt{\frac{48}{39}}$ ÷3 ÷3 $= \frac{5}{1}\cdot\sqrt{\frac{16}{13}}$

$= \frac{5}{1}\cdot\frac{\sqrt{16}}{\sqrt{13}} = \frac{5}{1}\frac{4}{\sqrt{13}}$

$= \frac{20}{\sqrt{13}}$ ← Can't have √ in denom

$= \frac{20}{\sqrt{13}}\frac{\sqrt{13}}{\sqrt{13}} = \frac{20\sqrt{13}}{\sqrt{13^2}}$

$= \boxed{\frac{20\sqrt{13}}{13}}$

23)

- Reminder…CHECK those answers and correct them!

Tuesday, May 12

Lesson: 11-7 Continued: Multiplying, Dividing, and Simplifying Radicals

Objective: Be able to simplify products and quotients of radicals.

- HI! We are still working on page 539

26) $7\sqrt{\frac{40}{49}}$

$\frac{7}{1}\frac{\sqrt{40}}{\sqrt{49}}$

$\sqrt{40}$ → $2 \cdot 20$ → $2 \cdot 2 \cdot 10$ → $2 \cdot 2 \cdot 2 \cdot 5$

$\frac{7}{1} \cdot \frac{\sqrt{2^2 \cdot 2 \cdot 5}}{\sqrt{7^2}}$

$\frac{\cancel{7}}{1}\frac{2\sqrt{2 \cdot 5}}{\cancel{7}}$

$2\sqrt{10}$

25)

28) $\frac{15\sqrt{6}}{\sqrt{90}}$

$\frac{15}{1}\sqrt{\frac{6}{90}} \cdot \frac{6}{6} = \frac{15}{1} \cdot \sqrt{\frac{1}{15}}$

$\frac{15}{1} \cdot \frac{\sqrt{1}}{\sqrt{15}} = \frac{15}{1}\frac{1}{\sqrt{15}}$

$\frac{15}{1}\frac{1}{\sqrt{15}}\frac{\sqrt{15}}{\sqrt{15}}$ can't have $\sqrt{}$ in denominator

$\frac{15}{1} \cdot \frac{\sqrt{15}}{\sqrt{15^2}} = \frac{\cancel{15}}{1} \cdot \frac{\sqrt{15}}{\cancel{15}} = \sqrt{15}$

27)

30) $\sqrt{7}(6-\sqrt{2})$

Subtraction distribute

$\sqrt{7}(6-\sqrt{2})$

$\sqrt{7}\ 6 - \sqrt{7}\cdot\sqrt{2}$

$6\sqrt{7} - \sqrt{14}$

29)

32) $(3\sqrt{5})(-\sqrt{10})(\sqrt{27})$ → All multiplication

$(3\ \sqrt{5})(-1\cdot\sqrt{10})(1\ \sqrt{27})$

$3\ -1\ 1\ \sqrt{5\ 10\ 27}$

$2\ 5\ 3\ 9$

$3\ 3$

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

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

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

$-45\sqrt{6}$

31)

34) $(5\sqrt{mn^2})(-2\sqrt{m})$

$(5\ \sqrt{m\ n^2})\ (-2\ \sqrt{m})$

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

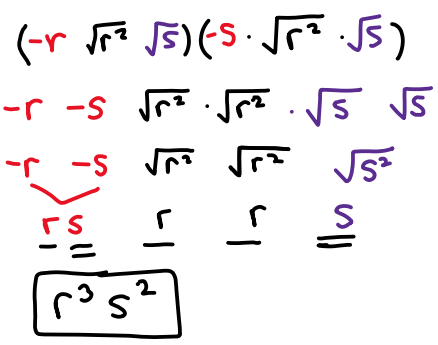
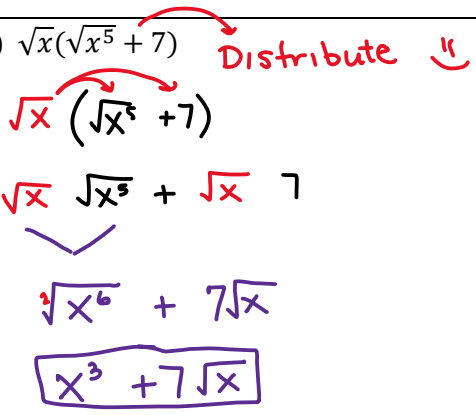
$5\cdot -2\ \ \sqrt{m}\ \ \sqrt{m}\cdot\sqrt{n^2}$

$-10\cdot\sqrt{m^2}\ \ \sqrt{n^2}$

$-10\ \ m\ \ n$

$-10mn$

33)

36) $(-r\sqrt{r^2s})(-s\sqrt{r^2s})$ 	35)
38) $\sqrt{x}(\sqrt{x^5}+7)$ 	37)

- Don't forget to check those ODD answers in the back of the book and show corrections!

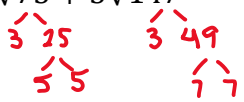
Wednesday, May 13

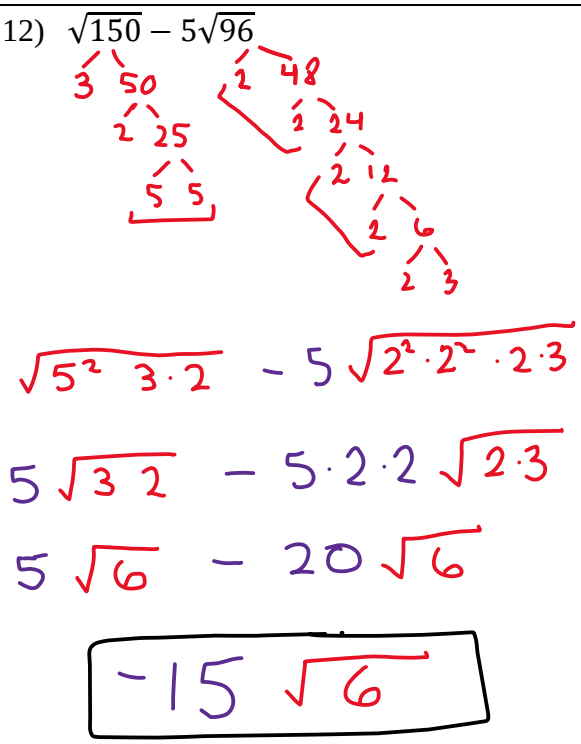
Lesson 11-8: Adding and Subtracting Radicals

Objective: Be able to simplify sums and differences of radicals.

- The last section, we were multiplying and dividing radicals. Now, we are going to ADD and SUBTRACT radicals.
- Please open the book to page 541.

2) $9\sqrt{5} + 4\sqrt{5}$ These match like $9x + 4x$ $13x$ So, $9\sqrt{5} + 4\sqrt{5}$ $13\sqrt{5}$	1)
4) $5\sqrt{80} - 12\sqrt{5}$ These do not match $5\sqrt{80} - 12\sqrt{5}$ $80 = 2 \cdot 40$ $40 = 2 \cdot 20$ $20 = 2 \cdot 10$ $10 = 2 \cdot 5$ $5\sqrt{2^2 \cdot 2^2 \cdot 5} - 12\sqrt{5}$ $5 \cdot 2 \cdot 2\sqrt{5} - 12\sqrt{5}$ $20\sqrt{5} - 12\sqrt{5}$ They match! $20\sqrt{5} - 12\sqrt{5}$ $8\sqrt{5}$	3)

6) $-2\sqrt{24} - 3\sqrt{6}$  $-2\sqrt{2^2 \cdot 2 \cdot 3} - 3\sqrt{6}$ $-2 \; 2\sqrt{2 \; 3} - 3\sqrt{6}$ $-4\sqrt{6} - 3\sqrt{6}$ $\boxed{-7\sqrt{6}}$	5)
8) $3\sqrt{45} + 7\sqrt{36}$  $3\sqrt{3^2 \; 5} + 7\sqrt{6^2}$ $3 \; 3\sqrt{5} + 7 \; 6$ $\boxed{9\sqrt{5} + 42}$ Can't add because they don't both have $\sqrt{5}$ $9x + 42$ - can't add these	7)
10) $-4\sqrt{75} + 3\sqrt{147}$  $-4\sqrt{5^2 \; 3} + 3\sqrt{7^2 \; 3}$ $-4 \; 5\sqrt{3} + 3 \; 7\sqrt{3}$ $-20\sqrt{3} + 21\sqrt{3}$ $1\sqrt{3}$ $\boxed{\sqrt{3}}$	9)

12) $\sqrt{150} - 5\sqrt{96}$	11)
	

- Great! Check and correct!

Thursday, May 14

Lesson 11-8 Continued: Adding and Subtracting Radicals

Objective: Be able to simplify sums and differences of radicals.

- Hello. We are still working on page 541!

16) $-3\sqrt{72} + 6\sqrt{52} - 7\sqrt{128}$

$-3x + 6y - 7z$ → You can't add them unless they match

$-3\sqrt{72} + 6\sqrt{52} - 7\sqrt{128}$

$72 = 36 \cdot 2$, $52 = 4 \cdot 13$, $128 = 64 \cdot 2$

$-3\sqrt{36}\sqrt{2} + 6\sqrt{4}\sqrt{13} - 7\sqrt{64}\cdot\sqrt{2}$

$-3 \cdot 6\sqrt{2} + 6 \cdot 2\sqrt{13} - 7 \cdot 8 \cdot \sqrt{2}$

$-18\sqrt{2} + 12\sqrt{13} - 56\sqrt{2}$

$-72\sqrt{2} + 12\sqrt{13}$

13)

20) $\sqrt{3} - \sqrt{\frac{1}{3}}$

* Fractions still need common denominators to add or subtract
* Also, No √'s in denominator.

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

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

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

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

$\frac{3\sqrt{3}}{3} - \frac{1\sqrt{3}}{3}$ ← common denominator

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

19)

22) $2\sqrt{75} + \sqrt{\frac{3}{16}}$

$\frac{2\sqrt{25 \cdot 3}}{1} + \frac{\sqrt{3}}{\sqrt{16}}$

$\frac{2 \cdot 5\sqrt{3}}{1} + \frac{\sqrt{3}}{4}$

$\frac{10\sqrt{3} \cdot 4}{1} + \frac{\sqrt{3}}{4}$

$\frac{40\sqrt{3}}{4} + \frac{1\sqrt{3}}{4}$ ← 😊

$\boxed{\frac{41\sqrt{3}}{4}}$

21)

24) $\sqrt{\frac{2}{7}} - \sqrt{\frac{7}{2}}$

Get rid of √s

$\frac{\sqrt{2}}{\sqrt{7}} - \frac{\sqrt{7}}{\sqrt{2}}$

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

$\frac{\sqrt{14}}{\sqrt{49}} - \frac{\sqrt{14}}{\sqrt{4}}$

No you need common denominators

$\frac{\sqrt{14}}{7} \cdot \frac{2}{2} - \frac{\sqrt{14}}{2} \cdot \frac{7}{7}$

$\frac{2\sqrt{14}}{14} - \frac{7\sqrt{14}}{14}$

$\boxed{\frac{-5\sqrt{14}}{14}}$

23)

26) $5\sqrt{\frac{16}{3}} - \sqrt{\frac{9}{2}}$

EASY

$\frac{5\sqrt{16}}{\sqrt{3}} - \frac{\sqrt{9}}{\sqrt{2}}$

$\frac{5\ 4}{\sqrt{3}} - \frac{3}{\sqrt{2}}$

$\frac{20}{\sqrt{3}}\frac{\sqrt{3}}{\sqrt{3}} - \frac{3}{\sqrt{2}}\frac{\sqrt{2}}{\sqrt{2}}$ Need to get rid of $\sqrt{}$

$\frac{20\sqrt{3}}{\sqrt{9}} - \frac{3\sqrt{2}}{\sqrt{4}}$

$\frac{20\sqrt{3}}{3}\,2 \quad - \frac{3\sqrt{2}}{2}\,3$ Need common denom

$\frac{40\sqrt{3}}{6} - \frac{9\sqrt{2}}{6}$

$\boxed{\frac{40\sqrt{3} - 9\sqrt{2}}{6}}$

These can't be subtracted because they are similar to $40x - 9y$

25)

- Please make corrections!

Friday, May 15

Lesson: Review 11:7 – 8 and Take a Quiz

Objective: Be able to simplify products, quotients, sums, and differences of radicals.

- Go to page 661-662 and complete and correct the given problems.
- The quiz after it will be SIMILAR.

103)	109)
113)	115)

117)	119)
123)	127)

- Here is the QUIZ!!!

1) $2\sqrt{3} \cdot 4\sqrt{3}$	2) $\sqrt{\frac{5}{9}} \cdot \sqrt{\frac{9}{5}}$
3) $\frac{12\sqrt{20}}{4\sqrt{3}}$	4) $\sqrt{x}(\sqrt{x^3} - 4)$

5) $7\sqrt{2} + 6\sqrt{2}$	6) $4\sqrt{28} + 6\sqrt{12}$
7) $\sqrt{\frac{2}{3}} - \sqrt{\frac{3}{2}}$	8) $3\sqrt{63} + 2\sqrt{28} - \sqrt{35}$

- You made it through. Great job!!!