Algebra 1B Live Lesson

U5L2: Operations with Radical Expressions
(Chapter 10-3 in textbook)

Agenda

1. Review selected problems and topics from U5L2 - Operations with Radical Expressions.

2. Use the 2-column note system to take better notes in math class. Bring your math notebook and pen or pencil to each math LiveLesson class.

2-Column Notes Template

1. Announcements/To Do's	1. Write down important details.
2. School-Wide Learner Outcomes	2. What are you going to work on this week?
3. LL Objectives	
4. Vocabulary words	4. Definitions (fill in as we go)
5. Problems	5. Steps to solving problems
6. Summary (End of class)	6. 1 or 2 sentences about the LL class.

Reminders and To – Do's

Information	What to do
1. Complete 1 math lesson per day.	1. Go to your Planner in Connexus to find the math lesson for the day
2. Check your WebMail every day	2. Go to Connexus to find WebMail
3. Be prepared to spend 4 - 6 hours per day on schoolwork.	3. Complete lessons for the day from your Planner. Do not get behind on lessons.
4. Remind your Learning Coach to take daily attendance	4. Have your Learning Coach log into Connexus daily.

Reminders and To – Do's

Information	What to do
5. Go to the Message Board first for information about our math class.	
6. Contact Mr. Elizondo for math questions. Remember: You need at least 2 phone calls with Mr. Elizondo per semester.	6. Call (559) 549 - 3244 and leave a voicemail if call is not answered. Make an appointment at: https://elizondo.youcanbook.me Send a WebMail

U5L2 – California Common Core State Standards

- HSN-RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents.

U5L2 - Vocabulary

- Like radicals
- Unlike radicals
- Conjugates

U5L2 - Objectives

- Simplify sums and differences of radical expressions
- Simplify products and quotients of radical expressions

U5L2 - Introduction

- **Like radicals** have the same radicand

Examples: $4\sqrt{3}$ $8\sqrt{3}$

- **Unlike radicals** have different radicands

Examples: $4\sqrt{6}$ $-2\sqrt{2}$

U5L2 - Combining Like Radicals

What is the simplified form of each expression?

A $6\sqrt{11} + 9\sqrt{11}$

$$6\sqrt{11} + 9\sqrt{11} = (6 + 9)\sqrt{11}$$

$$= \mathbf{15\sqrt{11}}$$

B $\sqrt{3} - 5\sqrt{3}$

$$\sqrt{3} - 5\sqrt{3} = (1 - 5)\sqrt{3}$$

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

U5L2: Simplifying to Combine Like Radicals

What is the simplified form of

$$5\sqrt{3} - \sqrt{12}$$

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

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

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

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

$$= 3\sqrt{3}$$

U5L2 - Multiplying Radical Expressions

When simplifying a product like,

$$\sqrt{10}(\sqrt{6}+3)$$

you can use the Distributive Property.

When simplifying a product like,

$$(\sqrt{6}-2\sqrt{3})(\sqrt{6}+3\sqrt{3})$$

you can use the FOIL method.

U5L2 - Multiplying Radical Expressions

What is the simplified form of

$$\sqrt{10}\left(\sqrt{6}+3\right)$$

$$= (\sqrt{10}\cdot\sqrt{6}) + (\sqrt{10}\cdot 3)$$

$$= \sqrt{60} + 3\sqrt{10}$$

$$= \sqrt{4}\cdot\sqrt{15} + 3\sqrt{10}$$

$$= \mathbf{2\sqrt{15} + 3\sqrt{10}}$$

U5L2 - Multiplying Radical Expressions

What is the simplified form of

$$(\sqrt{6} - 2\sqrt{3})(\sqrt{6} + 3\sqrt{3})$$

$$= \sqrt{36} + 3\sqrt{18} - 2\sqrt{18} - 6\sqrt{9}$$

$$= 6 + \sqrt{18} - 6 \cdot 3$$

$$= 6 + \sqrt{9} \cdot \sqrt{2} - 18$$

$$= 6 + 3\sqrt{2} - 18$$

$$= \mathbf{-12 + 3\sqrt{2}}$$

U5L2 - Conjugates

Conjugates are the sum and difference of the same two terms.

$a + b$ $\quad$ $a - b$

The conjugate of

$\sqrt{7} + \sqrt{3}$ is $\sqrt{7} - \sqrt{3}$

Why they're useful:

$$(\sqrt{7} + \sqrt{3})(\sqrt{7} - \sqrt{3})$$

$$= (\sqrt{7})^2 - (\sqrt{3})^2$$

$$= 7 - 3 = 4$$

The product of the conjugates has no radicals.

U5L2 - Conjugates

What is the simplified form of

$$\frac{10}{\sqrt{7}-\sqrt{2}}$$

$$= \frac{10}{\sqrt{7}-\sqrt{2}} \cdot \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}}$$

$$= \frac{10(\sqrt{7}+\sqrt{2})}{7-2}$$

$$= \frac{10(\sqrt{7}+\sqrt{2})}{5}$$

$$= 2(\sqrt{7}+\sqrt{2})$$

$$= \mathbf{2\sqrt{7}+2\sqrt{2}}$$

Questions?

- Check the Message Board first
- Send a WebMail
- You can also make an appointment at https://elizondo.youcanbook.me
- You can also call me at (559) 549-3244. If I'm not available to answer your call, please leave a voicemail with your full name and phone number.

U5L2 - Review Problems

Simplify each expression.

1) $6\sqrt{8} - 2\sqrt{50}$

$$6\sqrt{8} - 2\sqrt{50} = 6\sqrt{4 \cdot 2} - 2\sqrt{25 \cdot 2}$$

$$= 6 \cdot 2\sqrt{2} - 2 \cdot 5\sqrt{2}$$

$$= 12\sqrt{2} - 10\sqrt{2}$$

$$= 2\sqrt{2}$$

U5L2 - Review Problems

Simplify each expression.

2) $\sqrt{8}\left(\sqrt{3}+3\right)$

$$\sqrt{8}\left(\sqrt{3}+3\right)=\sqrt{24}+3\sqrt{8}$$

$$=\sqrt{4\cdot 6}+3\sqrt{4\cdot 2}$$

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

$$=2\sqrt{6}+6\sqrt{2}$$

U5L2 - Review Problems

Simplify each expression.

3) $\left(\sqrt{3}+4\right)^2$

$$\left(\sqrt{3}+4\right)^2 = \left(\sqrt{3}+4\right)\left(\sqrt{3}+4\right)$$

$$= 3+4\sqrt{3}+4\sqrt{3}+16$$

$$= 19+8\sqrt{3}$$

U5L2 - Review Problems

Simplify each expression.

4) $\dfrac{32}{\sqrt{7}-\sqrt{3}}$

$$\frac{32}{\sqrt{7}-\sqrt{3}} = \frac{32}{\sqrt{7}-\sqrt{3}} \cdot \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}+\sqrt{3}} \qquad \left(\sqrt{7}+\sqrt{3}\right)\left(\sqrt{7}-\sqrt{3}\right) = \left(\sqrt{7}\right)^2 - \left(\sqrt{3}\right)^2 = 7-3$$

$$= \frac{32\left(\sqrt{7}+\sqrt{3}\right)}{4}$$

$$= 8\left(\sqrt{7}+\sqrt{3}\right)$$

$$= 8\sqrt{7}+8\sqrt{3}$$

U5L2: Review Problems

Simplify each expression.

5) $\dfrac{30}{\sqrt{5}+\sqrt{2}}$

$$\frac{30}{\sqrt{5}+\sqrt{2}} = \frac{30}{\sqrt{5}+\sqrt{2}} \cdot \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}}$$

$$= \frac{30\left(\sqrt{5}-\sqrt{2}\right)}{5-2}$$

$$= \frac{30\left(\sqrt{5}-\sqrt{2}\right)}{3}$$

$$= 10\left(\sqrt{5}-\sqrt{2}\right)$$