Algebra 1B Live Lesson

U3L1 – Adding and Subtracting Polynomials
(Chapter 8-1 in textbook)

Agenda

1. Review selected problems and topics from U3L1.

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

U3L1 – California Common Core State Standards

- HSA-APR.A.1: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

U3L1 - Objectives

- Classify, add, and subtract polynomials

U3L1 - Vocabulary

- Monomial
- Degree of a monomial
- Polynomial
- Standard form of a polynomial
- Degree of a polynomial
- Binomial
- Trinomial

U3L1 - Vocabulary

Monomial:

a real number (-18. -5. $\frac{2}{3}$)

a variable (x, y, b)

a product of a real number and one or more variables with whole-number exponents

$(-4x^2, 2.5x, y^3, \frac{a}{3})$

Degree of a monomial: sum of the exponents of its variables

Degree of a nonzero constant is 0

Zero has no degree

U3L1 - Finding the Degree of a Monomial

What is the degree of each monomial?

$8xy$	Degree: 2	$8xy = 8x^1y^1$
$-7y^4z$	Degree: 5	$-7y^4z = -7y^4z^1$
11	Degree: 0	$11 = 11x^0$

U3L1 - Adding and Subtracting Monomials

What is the sum or difference?

$$3x^2 + 5x^2 = \ 8x^2$$

$$4x^3y - x^3y = \ 3x^3y$$

$$2x^2y^4 - 7x^2y^4 = -5x^2y^4$$

U3L1 - Polynomials

A **polynomial** is a monomial or a sum of monomials. The following polynomial is the sum of the monomials $3x^4$, $5x^2$, $-7x$, and 1.

$$3x^4 + 5x^2 - 7x + 1$$

Degree of each monomial: 4, 2, 1, 0

Standard form of a polynomial means that the degrees of its monomial terms decrease from left to right.

The **degree of a polynomial** in one variable is the same as the degree of the monomial with the greatest exponent.

The degree of $3x^4 + 5x^2 - 7x + 1$ is 4.

U3L1 - Naming Polynomials

Polynomial	Degree	Name Using Degree	Number of Terms	Name Using Number of Terms
6	0	Constant	1	Monomial
$3x-2$	1	Linear	2	Binomial
$4x^2+3x-4$	2	Quadratic	3	Trinomial
$8x^3$	3	Cubic	1	Monomial
$9a^4-3a^3+9a$	4	Fourth degree	3	Trinomial

U3L1 - Classifying Polynomials

Write each polynomial in standard form. What is the name of the polynomial based on its degree and number of terms?

$3x + 4x^2$

$4x^2 + 3x$ Place terms in order.

This is a quadratic binomial.

$4x - 1 + 5x^3 + 7x$

$5x^3 + 4x + 7x - 1$ Place terms in order.

$5x^3 + 11x - 1$ Combine like terms.

This is a cubic trinomial.

U3L1 - Adding Polynomials

Travel A researcher studied the number of overnight stays in U.S. National Park Service campgrounds and in the backcountry of the national park system over a 5-yr period. The researcher modeled the results, in thousands, with the following polynomials.

Campgrounds: $-7.1x^2 - 180x + 5800$

Backcountry: $21x^2 - 140x + 1900$

In each polynomial, $x = 0$ corresponds to the first year in the 5-yr period. What polynomial models the total number of overnight stays in both campgrounds and backcountry?

Method 1 Add vertically.

Line up like terms. Then add the coefficients.

$$\begin{array}{r} -7.1x^2 - 180x + 5800 \\ +\ 21x^2 - 140x + 1900 \\ \hline 13.9x^2 - 320x + 7700 \end{array}$$

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Method 2 Add horizontally.
Group like terms. Then add the coefficients.

$$(-7.1x^2 - 180x + 5800) + (21x^2 - 140x + 1900)$$

$$= (-7.1x^2 + 21x^2) + (-180x - 140x) + (5800 + 1900)$$

$$= 13.9x^2 - 320x + 7700$$

U3L1 - Subtracting Polynomials

What is a simpler form of $(x^3 - 3x^2 + 5x) - (7x^3 + 5x^2 - 12)$?

Method 1 Subtract vertically.

$$\begin{array}{r} x^3 - 3x^2 + 5x \\ -\,(7x^3 + 5x^2 - 12) \\ \hline x^3 - 3x^2 + 5x \\ -7x^3 - 5x^2 + 12 \\ \hline -6x^3 - 8x^2 + 5x + 12 \end{array}$$

Line up like terms.

Then add the opposite of each term in the polynomial being subtracted.

Method 2 Subtract horizontally.

$$(x^3 - 3x^2 + 5x) - (7x^3 + 5x^2 - 12)$$

$= x^3 - 3x^2 + 5x - 7x^3 - 5x^2 + 12$ Write the opposite of each term in the polynomial being subtracted.

$= (x^3 - 7x^3) + (-3x^2 - 5x^2) + 5x + 12$ Group like terms.

$= -6x^3 - 8x^2 + 5x + 12$ Simplify.

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.