


00:03 00

**Warm Up:**

Christa & Sarah are playing a card game. Sarah's card has a letter A on it and on the other side has "44x + 99y". Christa's card has a letter B on it and on the other side "22x + 33y". Find the sum of cards A + B




Dec 12-7:52 AM

**Agenda:**

Objectives:

- Students can define monomial, binomial and trinomial.
- Students will be able to multiply monomials and find the degree of a term.

Reminders:



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**PolyNomial**

$$4xy^2 + 3x - 5$$

terms

example of a polynomial  
this one has 3 terms

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• Multiplying Monomials & Polynomials

Monomial

Binomial

Trinomial

May 14-7:59 AM

• Multiplying Monomials & Polynomials

**How to Expand Powers**


**2<sup>4</sup>**

The little number "4" is called the "Index" or "Exponent" and tells us how many times to multiply out the big number "2"

The big number "2" is called the "base" and is what we multiply together

$2^4 = 2 \times 2 \times 2 \times 2$  ✓

Multiply four of the Base Number




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• Multiplying Monomials & Polynomials

**Multiply each of the following:**

1.  $x(x)$       2.  $3x^2(3x)$       3.  $4x(-5x^5)$

**Based on your solutions,** write a rule for what to do when you multiply terms with the same base:



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• Multiplying Monomials & Polynomials

The *degree of a polynomial* is the LARGEST exponent of that term.

• Example:  
 $-9x^7$  the degree of this monomial is 7

If the term is made up of *more than one variable*, you add exponents to find the degree of that term.

• Example:  
 $-9x^2y^3$  the degree of this monomial is 10



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• Multiplying Monomials & Polynomials


Here are the solutions to the last 3 problems:

1.  $x(x)$       2.  $3x^2(3x)$       3.  $4x(-5x^5)$

Deg: \_\_\_\_      Deg: \_\_\_\_      Deg: \_\_\_\_

What is the DEGREE of each monomial?



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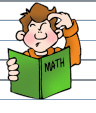
• Multiplying Monomials & Polynomials

Multiply each of the following:

1.  $2xy(x^3)$       2.  $-3x^2y^2(-4xy)$       3.  $4x^2y^4(-x^5y^2)$

*Based on your solutions*, write a **rule** for what to do when you multiply terms with the same base and there are *multiple variables*:

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• Multiplying Monomials & Polynomials

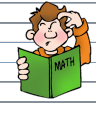
Here are the solutions to the last 3 problems:

1.  $2xy(x^3)$       2.  $-3x^2y^2(-4xy)$       3.  $4x^2y^4(-x^5y^2)$

Deg: \_\_\_\_      Deg: \_\_\_\_      Deg: \_\_\_\_

What is the DEGREE of each monomial?



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• Multiplying Monomials & Polynomials

For the remainder of the class you are your on the practice problems attached for Multiplying Polynomials.

I WILL BE GRADING RANDOM QUESTIONS ON THIS SHEET SO BE SURE NOT TO WASTE CLASS TIME!!

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**Homework:**

1)  $6x^4$       11)  $90x^5y^{19}$   
 3)  $-8x^{10}$       13)  $35x^9y^{14}$   
 5)  $27x^5$       15)  $-4x^4y^2$   
 7)  $-12x^{12}$       17)  $6x^4y^2z^3$   
 9)  $63x^5y^6$       19)  $21x^4y^3z^2$

Feb 3-12:08 PM

• Multiplying Monomials & Polynomials

**Warm Up**

Degree of a polynomial is the highest exponent.  
Determine the degree of each polynomial:

- $4x - 2x^2 + 10$  Degree = \_\_\_ WHY?
- $13x^3 - 5x^5 + 9x$  Degree = \_\_\_ WHY?
- $7 - x$  Degree = \_\_\_ WHY?

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• Multiplying Monomials & Polynomials

**Agenda:**

**Objectives:**

- Students will be able to distribute a monomial to a polynomial and find the degree of a term.

**Reminders:**



You have to learn the rules of the game. And then you have to play better than anyone else.  
Albert Einstein

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• Multiplying Monomials & Polynomials

**RECALL:**

$3x(x)$                        $4x^2(6x^5)$

**Steps for Multiplying Monomials**

- \_\_\_\_\_ coefficients
- \_\_\_\_\_ exponents with the same base

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• Multiplying Monomials & Polynomials

**Using the \_\_\_\_\_**

**simplify each:**

- $3x(x-2y)$
- $4x^2(-x+y)$
- $2x^2y(-4x+5y)$


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• Multiplying Monomials & Polynomials

**Regents Questions:**

Find the **product** for each given expression and simplify completely. Name the **degree** of each polynomial.

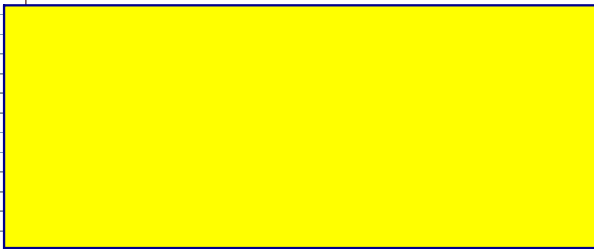
- $12y^3(3x^2 + 4xy)$
- $7y^5(y^4 + 4y^3 + y^2 - 3)$
- $9x^3y^5(2x^2y + 4xy^3)$



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• Multiplying Monomials & Polynomials

Let's look at another operation we'll use with polynomials.

$$\frac{x^5}{x^3} = \frac{(x)(x)(x)(x)(x)}{(x)(x)(x)} =$$


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• Multiplying Monomials & Polynomials

### Steps for Dividing Polynomials:

1. \_\_\_\_\_ the term in the denominator into ALL terms of the numerator.
2. Divide coefficients
3. \_\_\_\_\_ exponents with the same base.

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• Multiplying Monomials & Polynomials

### Examples for Dividing Polynomials:

$$\frac{3x^2 + 12x}{3x}$$

$$\frac{8y^3 - 10y^2 + 6y}{2y}$$

$$\frac{9x^3 + 18x^2 - 27x}{3x}$$

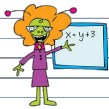
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• Multiplying Monomials & Polynomials

**★ Dividing Polynomials**

If you ADD exponents when you MULTIPLY the same base, what do you think you do to your exponents when you DIVIDE the same base?

1.  $\frac{3x^2 + 12x}{3x}$
2.  $\frac{8y^3 - 10y^2 + 6y}{2y}$
3.  $\frac{9x^3 + 18x^2 - 27x}{3x}$



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• Multiplying Monomials & Polynomials

For the remainder of the class you are your on the practice problems attached for Multiplying Polynomials.


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**Warm Up:**



If  $A = 5x^2$  and  $B = 3x^2 + 2x - 1$ , find the sum of A and B.




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**Agenda:**

Objectives:

- Students can determine the rule for raising a power to a power.

Reminders:




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• Multiplying Monomials & Polynomials

Write the following expressions in expanded form. Simplify if possible

$3^2$	$3x^2$	$(3x^2)^3$

What's the difference in each column?




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• Multiplying Monomials & Polynomials

Can you write  $(3x^4)^2$  in expanded form.

Now simplify the expression.



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• Multiplying Monomials & Polynomials

### Power of Power – Shortcut Rule

$$(a^m)^n = a^{m \times n}$$

\*\*\*I will always write out my expression and then just use the rule that when you multiply the same base, you add exponents.

$(2^3)^4 = 2^3 \times 4 = 2^{12} \checkmark$   
 $(n^2)^4 = n^2 \times 4 = n^8 \checkmark$

The Power of Power Rule involves Multiplying the two Index Powers.

This rule only works if there is a single Positive Base inside the brackets.

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• Multiplying Monomials & Polynomials

Simplify each expression.

	Expanded Form:	Simplified:
1. $(-2x^3)^4$		
2. $(-2x^3y)^2$		
3. $(5x^2y^3)^2$		
4. $(-6x^2y^3)^4$		


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• Multiplying Monomials & Polynomials


For the remainder of the class you are your on the practice problems attached for Multiplying Polynomials.

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~~Warm Up:~~ 

If  $A = 5x^2$  and  $B = 3x^2 + 2x - 1$ , find the product of  $AB$ .



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**Agenda:**

**Objectives:**

- Students can determine the rule for a 0 exponent and for negative exponents


**Reminders:**

"Leaders aren't born, they are made. And they are made just like anything else, through hard work. And that's the price we'll have to pay to achieve that goal, or any goal." - Vince Lombardi

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• 0 and Negative Exponents

\*\* RECALL \*\*



**\*\* MULTIPLY:**

$$4x^3y(-2z)$$

**\*\* DIVIDE:**

$$\frac{15x^6}{5x^3}$$


**\*\* POWER TO A POWER:**

$$(5x^2y^3)^3$$

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• 0 and Negative Exponents

Fill in the table below:



Term	Value
$5^4$	625
$5^3$	25
5	
$5^{-1}$	$\frac{1}{25}$
	$\frac{1}{125}$
$5^{-4}$	

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• 0 and Negative Exponents

**\*\* What happens in the value column going top to bottom?**

**\*\* Based on the table do you think all negative exponents will be fractions? Why or why not?**

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• 0 and Negative Exponents

**\*\* What is the exponent when the value is one? Do you think any term raised to that power will be one? Why or why not? Give an example to prove your response.**

**\*\* Based on your answers about the table write a (1) rule about zero exponents and a (2) rule about negative exponents.**

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• 0 and Negative Exponents

For the remainder of the class you are your on the practice problems attached for Zero and Negative Polynomials.

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• Adding Polynomials

**Simplify each:**

1.  $(8x^2 - x + 3) + (2x^2 + 6x + 1)$



2.  $(3x^2 - 8x - 7) + (x^2 + 9)$

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• Adding Polynomials

*Extra Practice if you are already done with #1 and 2.*

Simplify each expression. Write your answer in standard form.

3.  $-6x + 7x + 13x$       4.  $5x^2 - 9 - 7x^2 + 16$

5.  $3xy + 7x - 8xy + 9x$       6.  $8a^2 + 9a - 9a^2 - 17a$

May 3-12:21 PM

• Adding Polynomials

**Answers**

1.  $-6x + 7x + 13x$       2.  $5x^2 - 9 - 7x^2 + 16$   
 $14x$        $(5x^2 + (-7x^2)) + (-9 + 16)$   
 $-2x^2 + 7$

3.  $3xy + 7x - 8xy + 9x$       4.  $8a^2 + 9a - 9a^2 - 17a$   
 $(3xy + (-8xy)) + (7x + 9x)$        $(8a^2 + (-9a^2)) + (9a + (-17a))$   
 $-5xy + 16x$        $-a^2 - 8a$

Back

May 3-12:21 PM

• Adding Polynomials

For the remainder of the class you are your on the practice problems attached for Adding Polynomials.

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**F** **Warm Up**

Let's practice the Distributive Property:

1.  $3(x + 5y)$       2.  $-2(3x + 1)$       3.  $4x(5 - 7y)$       4.  $-2x^2(y^2 + 5)$

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**Agenda:**

**Objectives:**

- Students can combine like terms (add polynomials) and write their answers in standard form.

**Reminders:**

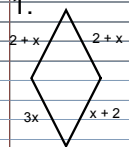
A TRUE **TEST** OF **CHARACTER** ISN'T HOW YOU ARE ON YOUR **BEST DAYS** BUT HOW YOU ACT ON YOUR **WORST DAYS**.

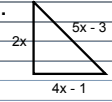
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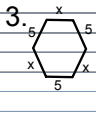


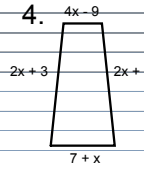
• Adding Polynomials

Find the perimeter of each polygon in terms of  $x$ .

1. 

2. 

3. 

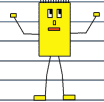
4. 

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• Adding Polynomials

Example:

A rectangle is drawn so that the length is four less than the width. Find the perimeter of the rectangle in terms of  $x$ . Find the area of the rectangle in terms of  $x$ . If the width is 12, find the length, perimeter and area of the rectangle.

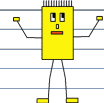


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• Adding Polynomials

For the remainder of the class you are your on the practice problems attached for Adding Polynomials.

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Warm Up 

Combine:

$(3x^2 - 4x + 7) + (2x^2 + 5x - 2)$



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**Agenda:**

Objectives:

- Students can combine like terms (subtract polynomials) and write their answers in standard form.

Reminders:

**CHARACTER BUILDS SLOWLY, BUT IT CAN BE TORN DOWN WITH INCREDIBLE SWIFTNES.**

FAITH BALDWIN

QuotePixel.com

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• Subtracting Polynomials

$(3x^2 - 4x + 7) - (2x^2 + 5x - 2)$

Circle ALL the OPERATIONS you see in the example above.

Addition                      Subtraction

Multiplication                      Division




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Subtracting Polynomials

$$(3x^2 - 4x + 7) - (2x^2 + 5x - 2)$$


What is the **one** and **only** thing that has changed in this new expression versus the warm up?



Will that change our answer? If so, how?

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Subtracting Polynomials

$$(3x^2 - 4x + 7) - (2x^2 + 5x - 2)$$


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Subtracting Polynomials

Simplify each of the following.

- $(2x^2 - 3x + 4) - (5x^2 + 7x - 9)$
- $(-x^2 - 5x - 6) - (x^2 + x - 1)$

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Subtracting Polynomials

Simplify each of the following.

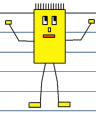
- $(4x^2 - x - 5) - (-x^2 - 6x - 9)$
- $(x^2 - x - 16) - (2x^2 + 4x - 1)$

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Subtracting Polynomials

For the remainder of the class you are your on the practice problems attached for Adding Polynomials.


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Warm Up

Combine:

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


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Subtracting Polynomials

**Agenda:**

**Objectives:**

- Students can combine like terms (subtract polynomials) and write their answers in standard form.

**Reminders:**



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Subtracting Polynomials

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Subtracting Polynomials

In the year 1985, the average cost of a washing machine could be modeled by the equation  $C = -9t^2 + 1500$  where  $t$  is the number of years since 1985. By the year 2004 the average cost had changed, so it could be modeled by the equation  $C = -15t^2 + 2000$ .

Find the difference in the average costs for a washing machine between 2004 and 1985.



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Subtracting Polynomials

Class work on Subtracting Polynomials (word problems)


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Review for Quiz

Dec 17-8:02 AM

**Warm Up**

Multiply. Write your answer in standard form.  
What is the degree of your polynomial?

$$3x^2(3x^2 - 4x + 7)$$


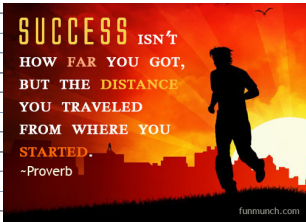
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**Agenda:**

Objectives:

- Students can multiply polynomials and write their answers in standard form.

Reminders:



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Multiplying Polynomials

We already know how to multiply a monomial by a polynomial. Let's try a binomial times a binomial. There are several methods on how we can do this.

**METHOD 1: DOUBLE DISTRIBUTE**

$$(x + 3)(x - 5) = x(x - 5) + 3(x - 5)$$

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Multiplying Polynomials

We already know how to multiply a monomial by a polynomial. Let's try a binomial times a binomial. There are several methods on how we can do this.

**METHOD 2: PUNNET SQUARE**

$$(x + 3)(x - 5) =$$

	x	+3
x		
-5		

Dec 12-7:52 AM

Multiplying Polynomials

We already know how to multiply a monomial by a polynomial. Let's try a binomial times a binomial. There are several methods on how we can do this.

**METHOD 3: FOIL**

$$(x + 3)(x - 5) = \underset{\text{First}}{x(x)} + \underset{\text{Outer}}{x(-5)} + \underset{\text{Inner}}{3(x)} + \underset{\text{Last}}{3(-5)}$$

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Multiplying Polynomials

Multiply each set of binomials. Write your answer in standard form. Use any method of multiplying. The punnet square is there for you if you prefer that method.


- $(x + 2)(x - 4)$
- $(x - 7)(x + 1)$
- $(4 - x)(5 - x)$


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Multiplying Polynomials


Class Work on Multiplying Binomials

Dec 12-7:52 AM

**Warm Up** 

Simplify. Write your answer in standard form.  
What is the degree of your polynomial?

$(x - 3)(x - 1)$




Dec 12-7:52 AM

**Agenda:**

**Objectives:**

- Students can multiply polynomials and write their answers in standard form.

**Reminders:**



Dec 12-7:52 AM

Multiplying Polynomials

In our warm up, we multiplied a **BINOMIAL** by another **BINOMIAL**.

Let's try a **BINOMIAL** times a **TRINOMIAL**!

$(x + 2)(x^2 + 5x + 1)$



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Multiplying Polynomials

Here are 2 more to try. Remember, you can multiply using any method! Write your answers in **standard form** and name the **degree** of your polynomial.

1.  $(x - 2)(x^2 - 5x + 3)$       2.  $(x - 1)(2x^2 - x - 7)$




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Multiplying Polynomials

**Class Work on Multiplying Polynomials**

Dec 12-7:52 AM

**Warm Up** 

Simplify. Write your answer in standard form.  
What is the degree of your polynomial?

$(x + 4)(3x^2 - 2x + 3)$


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**Agenda:**

Objectives:

- Students can multiply polynomials and write their answers in standard form.

Reminders:



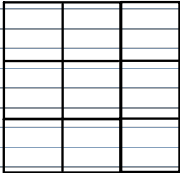
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Multiplying Polynomials

In our warm up, we multiplied a BINOMIAL by another TRINOMIAL.

Let's try a TRINOMIAL times a TRINOMIAL!


$(x^2 + 2x + 3)(x^2 + 5x + 1)$



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Multiplying Polynomials

Given the rectangle shown, find the perimeter of the rectangle in terms of  $x$  and then find the area in terms of  $x$ .



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Multiplying Polynomials


Cameron bought a carpet in the shape of a square. The length of one side was given as  $x^2 + 4x - 8$ . Find the area of the carpet in terms of  $x$ . If  $x = 5$  feet, find the actual area of the carpet.

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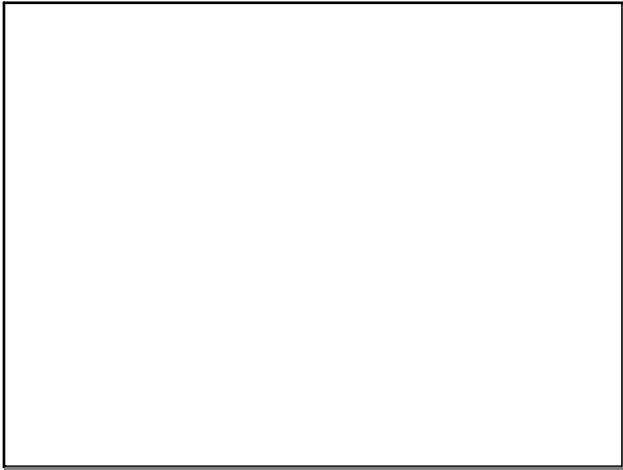
Multiplying Polynomials

Class Work on Word Problems, 3 x 3's.

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Dec 17-8:18 AM



Dec 17-8:18 AM