

Warm up

Use a vertical or horizontal format to add or subtract.

1. $(-3a^2 + 5) + (-a^2 + 4a - 6)$

2. $(3a^3 - 4a^2 + 3) - (a^3 + 3a^2 - a - 4)$

Warm Up (Day 2)

$$(2y + 1)(3y - 4)$$

$$6y^2 - 8y + 3y - 4$$

$$\underline{6y^2 - 5y - 4}$$

Warm Up

Week 6

1) $(2y^2 - 5y + 1) + (y^2 - y - 4)$

$$3y^2 - 6y - 3$$

2) $(7x - 3x^3) + (16 - 8x^3 + 5x^2 - x)$

$$-11x^3 + 5x^2 + 6x + 16$$

3) $(t^2 - 6t + 2) + (5t^2 - t - 8)$

$$6t^2 - 7t - 6$$

4) $(8x^3 - x^2 - 5x + 1) + (3x^3 + 2x^2 - x + 7)$

$$11x^3 + x^2 - 6x + 8$$

**ENERGY USE** In Exercises 67–69, use the following information.

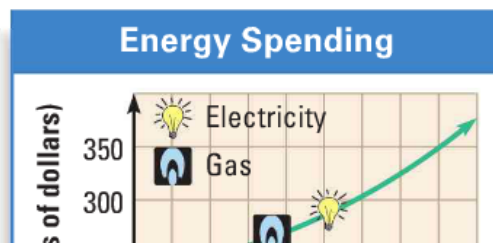
From 1989 through 1993, the amounts (in billions of dollars) spent on natural gas N and electricity E by United States residents can be modeled by the following equations, where t is the number of years since 1989.

► Source: U.S. Energy Information Administration

Gas spending model: $N = 1.488t^2 - 3.403t + 65.590$

Electricity spending model: $E = -0.107t^2 + 6.897t + 169.735$

67. Find a model for the total amount A (in billions of dollars) spent on natural gas *and* electricity by United States residents from 1989 through 1993.



$$A = 1.488t^2 - 3.403t + 65.590 + -0.107t^2 + 6.897t$$

$$+ 169.735$$

**POPULATION** In Exercises 65 and 66, use the following information.

Projected from 1950 through 2010, the total population P and the male population M of the United States (in thousands) can be modeled by the following equations, where t is the number of years since 1950.



DATA UPDATE of U.S. Bureau of the Census data at www.mcdougallittell.com

Total population model: $P = 2387.74t + 155,211.46$

Male population model: $M = 1164.16t + 75,622.43$

65. Find a model that represents the female population F of the United States from 1950 through 2010.
66. For the year 2010, the value of P is 298,475.86 and the value of M is 145,472.03. Use these figures to predict the female population in 2010.

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

10.2 Multiplying Polynomials

Goals:

- Multiply two polynomials.
- Use polynomial multiplication in real-life situations.

EQ: What are the three different methods for multiplying polynomials?

Algebra 1.5		DATE
② LAST UNIT/Experience Quadratic Equations	① CURRENT UNIT Polynomials & Factoring	③ NEXT UNIT/Experience Rational Equations
⑧ Student Activities or Assignments	⑤ UNIT MAP	
<ol style="list-style-type: none"> 1. 10.1 2. 10.2 3. 10.3 4. 10.4 5. 10.5 6. 10.6 7. 10.7 8. 10.8 		
⑦ UNIT SELF-TEST QUESTIONS	<ol style="list-style-type: none"> 1. When adding & subtracting polynomials, how do you combine like terms? 2. How do you use distributive property, FOIL, and diagrams to multiply polynomials? 3. What is the method for factoring trinomials? 4. How is factoring & the Zero-Product Property used to solve polynomials? 	⑥ UNIT RELATIONSHIPS Factor Solve Calculate Simplify

Vocabulary

FOIL: used to Multiply 2 Binomials

First

Outside

Inside

Last

Example 1: Using the Distributive Property

Find the product. FOIL

$$\begin{aligned} \text{a. } (x-5)(x+7) &= x^2 + 7x - 5x - 35 \\ &= x^2 + 2x - 35 \end{aligned}$$

$$\begin{aligned} \text{b. } (2x-5)(-4x) &= -8x^2 + 20x \end{aligned}$$

Find the product.

*Distributive Property
Method*

a. $(x - 5)(x + 7)$

$$x(x+7) + (-5)(x+7)$$

$$x^2 + 7x - 5x - 35$$

$$x^2 + 2x - 35$$

Example 2: Multiplying Binomials Using the FOIL Pattern

		F	O	I	L	
		↓	↓	↓	↓	
$(x - 5)(7x + 1)$	$=$	$7x^2$	$+ 1x$	$- 35x$	$- 5$	

$$= 7x^2 - 34x - 5$$

Example 3: Multiplying Polynomials VerticallyFind the product $(4 - x)(8 - 11x + x^2)$.

$$32 - 44x + 4x^2 - 8x + 11x^2 - x^3$$

$$-x^3 + 15x^2 - 52x + 32$$

	8	-11x	x ²
4	32	-44x	4x ²
-x	-8x	11x ²	-x ³

$$-x^3 + 15x^2 - 52x + 32$$

Example 4: Multiplying Polynomials HorizontallyFind the product $(2x^3 - 9x^2 - 11x)(2 - x^2)$.*Hint: Multiply $2 - x^2$ by each term of $2x^3 - 9x^2 - 11x$*

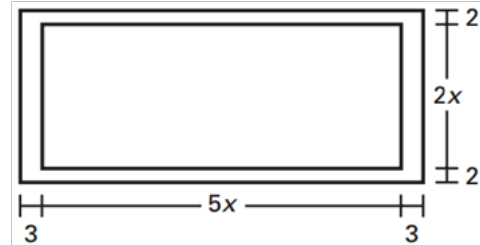
	2x ³	-9x ²	-11x
2	4x ³	-18x ²	-22x
-x ²	-2x ⁵	9x ⁴	11x ³

$$-2x^5 + 9x^4 + 15x^3 - 18x^2 - 22x$$

$$(2 - x^2)(2x^3 - 9x^2 - 11x) =$$

Example 5: Multiplying Binomials to Find an Area

The diagram at the right shows the basic dimensions for a swimming pool. The pool has a length-to-width ratio of 5:2. The walkway measures 2 meters on each side of the width and 3 meters on each side of the length.



a) Write a polynomial expression that represents the total area of the swimming pool, including the walkway.

b) Find the area when $x = 10, 20, 30, 40,$ and 50 meters.

$x(m)$	10	20	30	40	50
$A(m^2)$					

Try It Write your answers in standard form.

1) Find the product $(13 - x^2)(x + 2)$.

Box Method

$$(13 - x^2)(x + 2)$$

	x	2
13	$13x$	26
$-x^2$	$-x^3$	$-2x^2$

$$-x^3 - 2x^2 + 13x + 26$$

$$13x + 26 - x^3 - 2x^2$$

$$-x^3 - 2x^2 + 13x + 26$$

2) Find the product $(11x^2 + 7x - 3)(-5x + 1)$.

	$11x^2$	$7x$	-3
$-5x$	$-55x^3$	$-35x^2$	$15x$
1	$11x^2$	$7x$	-3

$$(-5x+1)(11x^2+7x-3) = -55x^3 - 24x^2 + 22x - 3$$

10.2 Homework Day 2

"Box" wkst (Binomials x Trinomials)

[starts with $w \cdot w^2$]

3) A picture has a length-to-width ratio of 3:2.
The frame adds 1 inch to each side.

a) Sketch and label the picture and frame.

b) Write a polynomial expression that represents the total area A of the picture, including the frame.

c) Find the area when $x = 2, 3, 4,$ and 5 inches.

10.2 Notes Continued (wkst)**Solve by using the Box Method.**

1)

	6	-A
6	36	-6A
A	6A	-A ²

$$-A^2 + 36$$

2)

	N	-9
N	N ²	-9N
-9	-9N	81

$$(N-9)(N-9)$$

$$N^2 - 18N + 81$$

3)

	3W	-8
3W		
8		

4)

	12B	-5C
12B	$144B^2$	$-60BC$
-5C	$-60BC$	$25C^2$

$$144B^2 - 120BC + 25C^2$$

5)

	T	4
T		
-4		

6)

	3x	2
3x		
-2		

7)

	W	KQ
W	W^2	WKQ
KQ	WKQ	K^2Q^2

$$(KQ)^2$$

$$W^2 + 2WKQ + K^2Q^2$$

8)

	A	B
A		
-B		

Summary

EQ: What are the three different methods for multiplying polynomials?

10.2 Homework