

learning focus:

- ✓ factor trinomials by using a gcf
- ✓ factor trinomials in the form $x^2 + bx + c$ and $ax^2 + bx + c$
- ✓ factor difference of two squares and perfect square trinomials

FACTORING POLYNOMIALS UNIT

7 DAY TEKS-ALIGNED UNIT



FACTORING POLYNOMIALS UNIT
Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	
7-15	Binder Covers, Dividers and Spine Labels	Student Handout 1
17-18	Factoring by Greatest Common Factor (GCF)	Homework 1
19	Factoring by Greatest Common Factor (GCF)	Student Handout 2
21-22	Factoring $x^2 + bx + c$	Homework 2
23	Factoring $x^2 + bx + c$	Student Handout 3
25-26	Factoring $ax^2 + bx + c$	Homework 3
27	Factoring $ax^2 + bx + c$	Mini Quiz 1
29	Factoring Mini Quiz	Student Handout 4
31-32	Difference of Squares	Homework 4
33	Difference of Squares	Student Handout 5
35-36	Perfect Square Trinomials	Homework 5
	Perfect Square Trinomials	Mini Quiz 2
		Review

FACTORING POLYNOMIALS STUDY GUIDE

Name _____ Pd _____
Date _____

Be sure to ask questions if you need more help with a topic.

FACTORIZING A GREATEST COMMON FACTOR.

1. Find the greatest common factor of the polynomial.

$18r^2 - 27r - 36 \rightarrow$ _____

2. Use the graphic organizer to factor the polynomial.

$16x^2 - 64x$
 $4x(4x - 16)$

3. Jude factored the polynomial as shown. Explain his mistake and correct the solution.

Perimeter: _____
Factor: _____

FACTORING POLYNOMIALS PACING GUIDE

DAY 1
Factoring by Greatest Common Factor (GCF)
Student Handout 1
Homework 1

DAY 2
Perfect Square Trinomials
Student Handout 5
Homework 3

DAY 3

DAY 4

DAY 5

FACTORING POLYNOMIALS



a 7 day TEKS-aligned unit

TEKS: A.10B, A.10D, A.10E, A.10F

ready-to-go, scaffolded
student materials

FACTORING POLYNOMIALS UNIT

Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	
7-15	Binder Covers, Dividers and Spine Labels	
17-18	Factoring by Greatest Common Factor (GCF)	Student Handout 1
19	Factoring by Greatest Common Factor (GCF)	Homework 1
21-22	Factoring $x^2 + bx + c$	Student Handout 2
23	Factoring $x^2 + bx + c$	Homework 2
25-26	Factoring $ax^2 + bx + c$	Student Handout 3
27	Factoring $ax^2 + bx + c$	Homework 3
29	Factoring Mini Quiz	Mini Quiz 1
31-32	Difference of Squares	Student Handout 4
33	Difference of Squares	Homework 4
35-36	Perfect Square Trinomials	Student Handout 5
37	Perfect Square Trinomials	Homework 5
39	Factoring Mini Quiz	Mini Quiz 2
41-42	Factoring Polynomials Study Guide	Review
43-44	Factoring Polynomials Unit Test	Test

©Maneuvering the Middle LLC, 2020

FACTORIZING POLYNOMIALS



a 7 day TEKS-aligned unit

TEKS: A.10B, A.10D, A.10E, A.10F

student friendly + real-world application

scaffolded concepts

Unit: Factoring Polynomials
Student Handout 3

Name _____
Date _____ Pd _____

FACTORIZING $AX^2 + BX + C$

The characteristics of a polynomial can change the method used to factor the polynomial. In this lesson we'll look at trinomials with leading coefficients, or values of _____, that are not equal to one. Use the checklist to help you factor the polynomial in example a.

✓ FACTORING CHECKLIST:

- Is there a GCF that can be factored out?
- Is the polynomial of the form $x^2 + bx + c$?
- Is the polynomial of the form $ax^2 + bx + c$?

Next, complete step 1 and 2 of the checklist.

To factor a polynomial of the form $ax^2 + bx + c$, use the "AC" method to help. Follow the steps in the checklist.

b. $3x^2 + 8x + 5$

$3x^2$ _____ + 5

Follow the steps above to factor each trinomial.

1. $4x^2 + 12x + 5$ ✓ CHECK:

a. $2x^2 + 14x + 20$

Factor the polynomials in 3-5 and then answer questions 6-9.

3. $6x^2 - 11x + 3$	4. $2k^2 - 5k - 12$	5. $3x^2 + 3x - 90$
---------------------	---------------------	---------------------

6. Is it possible to have a polynomial of your answer with an example. If no, explain why.

7. Trent factors $4x^2 + 13x + 3$. He determines that his integers must add to 13 and multiply to 3. He sets up his factors as shown below. Determine his mistake and correctly factor the polynomial.

$(x + 12)(x + 1)$

9. Paulo has a vintage record player in his room. The volume of the player is $10x^2 - 65x - 10$ cubic feet. Determine the possible dimensions for the length, width, and height of the record player. (Hint: $V = lwh$)

Summarize today's lesson:

Unit: Factoring Polynomials
Homework 3

Name _____
Date _____ Pd _____

FACTORIZING $AX^2 + BX + C$

Factor each of the polynomials in 1-6 and use the answer bank to check your work. Not all choices will be used.

Answer Bank: $(2x - 5)$, $(6x - 1)$, $(x + 9)$, $(7x - 2)$, $(x + 2)$, $(3x - 1)$, $(6x + 1)$, $(x - 9)$, $(4x + 3)$, $(3x + 1)$, $(4x - 3)$, $(x - 1)$, $(2x + 3)$, $(7x + 2)$

1. $7x^2 + 16x + 4$	2. $3x^2 + 26x - 9$	3. $12x^2 - 28x - 5$
4. $6x^2 - 55x + 9$	5. $4x^2 - x - 3$	6. $21x^2 + x - 2$

Use your knowledge of factoring to answer questions 7 and 8.

7. Fernando and Risa are factoring $5x^2 - x - 6$. They each made a chart below and selected a pair of integers. Which student is correct? Explain your reasoning.

FERNANDO		RISA	
FACTORS	SUM	FACTORS	SUM
1 · -6	-5	-3 · 10	7
-1 · 6	5	3 · -10	-7
2 · -3	-1	5 · -6	-1

8. Lawson is pouring a rectangular concrete slab for his doghouse. The slab will cover an area of $5x^2 + 12x - 9$ square feet. Write expressions that represent possible dimensions for the length and width of the concrete slab.

error analysis

FACTORIZING POLYNOMIALS



a 7 day TEKS-aligned unit

TEKS: A.10B, A.10D, A.10E, A.10F

streamline your planning process with unit overviews

FACTORIZING POLYNOMIALS OVERVIEW

STANDARDS	
READINESS	SUPPORTING
<p>A.10E factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$, including perfect square trinomials of degree two</p>	<p>A.10(B) multiply polynomials of degree one and degree two</p> <p>A.10(D) rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property</p> <p>A.10(F) decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial</p>

PIG IDEAS

- Factoring a polynomial helps us discover terms that were multiplied together to result in the polynomial.
- Trinomials can be factored
- Trinomials can often be factored
- Certain forms of binomials

ESSENTIAL QUESTIONS

- How are multiplying polynomials done?
- What helps you determine if a polynomial is factorable?
- What is the factoring pattern for a trinomial?
- What is the factoring pattern for a binomial?

✓ key vocabulary
 ✓ vertical alignment

sample pacing calendar

FACTORIZING POLYNOMIALS PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Factoring by Greatest Common Factor (GCF)	Factoring $x^2 + bx + c$	Factoring $ax^2 + bx + c$	Factoring Mini Quiz	Difference of Squares
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	DAY 7			
Perfect Square Trinomials	Factoring Mini Quiz			
Student Handout 5 Homework 5	Mini Quiz 2			

FACTORIZING POLYNOMIALS OVERVIEW

TOPIC	TEACHING TIPS
Factoring $x^2 + bx + c$	<ul style="list-style-type: none"> Algebra tiles are a very helpful way to introduce this concept. Factoring is brand new for students at this point, so beginning with something hands-on and tangible can help the concept seem less abstract. Students may benefit from seeing this type of factoring demonstrated with the "box method". Practicing on dry erase boards is a great way to allow students to more easily erase and adjust their solutions as they are solving.
Factoring $ax^2 + bx + c$	<ul style="list-style-type: none"> Guessing and checking on polynomials where "a" is not equal to 1 can be very time consuming and overwhelming for some students. Teaching students a method, such as the "AC method", helps give them a starting point and an effective strategy. While our student handouts focus on the "AC Method", feel free to search for "Bottoms Up" and the box method if you need another approach for your students.
Factoring Special cases	<ul style="list-style-type: none"> Consider having students create a reference chart of perfect squares. This will help them quickly identify differences of squares as well as perfect square trinomials.

teaching ideas

FACTORIZING POLYNOMIALS



a 7 day TEKS-aligned unit

TEKS: A.10B, A.10D, A.10E, A.10F

unit study guide + assessments

✓ quizzes

✓ editable unit test

Unit: Factoring Polynomials
Mini Quiz 1

Name _____
Date _____ Pd _____

FACTORIZING MINI-QUIZ

Factor each polynomial. Be sure to show all work.

1. $-9x^2 - 30x$	2. $x^2 - 2x - 35$	5. Mae is considering two different rectangular rugs for her living room. The area of each rug is shown below, and she needs the width of the rug to be $2x + 9$ feet. Which rug should she purchase?
3. $2x^2 + 18x + 36$	4. Which is a factor of $3x^2 + 5x - 4$?	

a. $3x + 5$
b. $3x - 4$
c. $x + 4$
d. $x - 4$

Unit: Factoring Polynomials
Review

Name _____
Date _____ Pd _____

FACTORIZING POLYNOMIALS STUDY GUIDE

Solve each problem below. Be sure to ask questions if you need more help with a topic.

I CAN FACTOR TRINOMIALS USING A GREATEST COMMON FACTOR. A.10E

1. For each expression, identify the greatest common factor if one exists.


a. $15c^2 - 65c$
b. $16x^2 - 64x + 64$
c. $8m^2 + 14m - 7$

2. Use the graphic organizer to factor the polynomial.

3. Factor each polynomial.

a. $14p^2 - 70p$ _____
b. $54x^2 - 12x + 24$ _____

5. Write an expression to represent the area of the rectangle.

 $8x + 16$

I CAN FACTOR TRINOMIALS IN THE FORM $x^2 + bx + c$

6. Kit needs to fill in the blanks below with missing values:

a. The sum should be _____. b. The product should be _____.

7. Factor $x^2 - 10x - 24$. 8. Factor $x^2 - 10x - 24$.

ALGEBRA 1 CURRICULUM

FACTORIZING POLYNOMIALS

UNIT SEVEN: ANSWER KEY

©MANEUVERING THE MIDDLE, 2020

answer keys included