

# Algebra 1B Live Lesson

## U3L7: Factoring Special Cases (Chapter 8-7 in textbook)



# Agenda



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1. Review selected problems and topics from U3L7.

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
2. School-Wide Learner Outcomes
3. LL Objectives
4. Vocabulary words
5. Problems
6. Summary (End of class)

1. Write down important details.
2. What are you going to work on this week?
3. Write down your own questions.
4. Definitions (fill in as we go)
5. Steps to solving problems
6. 1 or 2 sentences about the LL class.

# Reminders and To – Do's



## Information

1. Complete 1 math lesson per day.
2. Check your WebMail every day
3. Be prepared to spend 4 - 6 hours per day on schoolwork.
4. Remind your Learning Coach to take daily attendance

## What to do

1. Go to your Planner in Connexus to find the math lesson for the day
2. Go to Connexus to find WebMail
3. Complete lessons for the day from your Planner. Do not get behind on lessons.
4. Have your Learning Coach log into Connexus daily.

# Reminders and To – Do's



## Information

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.

## What to do

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

## U3L7 – California Common Core State Standards

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- HSA-SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

# U3L7 - Objectives



- Factor perfect-square trinomials and the differences of two squares.

# U3L6 - Review



What is the factored form of  $6x^2 + 13x + 5$  ?

1) Label:  $a = 6, b = 13, c = 5$

2) Multiply  $ac$ :  $6 * 5 = 30$

3) Find factors of  $ac$  that have a sum of  $b$

Since  $ac = 30$  and  $b = 13$ , find positive factors of 30 that have a sum of 13.

$$1 * 30 \quad 1 + 30 = 30$$

$$2 * 15 \quad 2 + 15 = 17$$

$$3 * 10 \quad 3 + 10 = 13$$

$$5 * 6 \quad 5 + 6 = 11$$

4) Use 3x and 10x

5) Re-write your equation with 2 spaces in the middle.

$$6x^2 + \underline{\quad} + \underline{\quad} + 5$$

6) Place factors from Step 3 into the trinomial and factor.

$$= 6x^2 + 3x + 10x + 5$$

$$= (6x^2 + 3x) + (10x + 5)$$

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

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



# U3L6 - Review



What is the factored form of  $8x^2 - 14x + 3$  ?

1) Label:  $a = 8, b = -14, c = 3$

2) Multiply **ac**:  $8 * 3 = 24$

3) Find factors of **ac** that have a sum of **b**

Since **ac = 24** and **b = -14**, find positive factors of 24 that have a sum of -14.

$$-1 * -24 \quad -1 + -24 = -25$$

$$-2 * -12 \quad -2 + -12 = -14$$

$$-3 * -8 \quad -3 + -8 = -11$$

$$-4 * -6 \quad -4 + -6 = -10$$

4) Use  $-2x$  and  $-12x$

5) Re-write your equation with 2 spaces in the middle.

$$8x^2 + \underline{\quad} + \underline{\quad} + 3$$

6) Place factors from Step 3 into the trinomial and factor.

$$= 8x^2 + (-2x) + (-12x) + 3$$

$$= (8x^2 - 2x) + (-12x + 3)$$

$$= 2x(4x - 1) - 3(4x - 1)$$

$$= (2x - 3)(4x - 1)$$

# U3L7 - Vocabulary



- perfect-square trinomial
- difference of two squares

# U3L7 - Introduction



- Recall the rules for **finding squares of binomials**.

$$(a + b)^2 = (a + b)(a + b) = a^2 + 2ab + b^2$$

$$(a - b)^2 = (a - b)(a - b) = a^2 - 2ab + b^2$$

- Any trinomial of the form  $a^2 + 2ab + b^2$  or  $a^2 - 2ab + b^2$  is a **perfect-square trinomial** because it is the result of squaring a binomial.

take note

## Key Concept Factoring Perfect-Square Trinomials

**Algebra** For every real number  $a$  and  $b$ :

$$a^2 + 2ab + b^2 = (a + b)(a + b) = (a + b)^2$$

$$a^2 - 2ab + b^2 = (a - b)(a - b) = (a - b)^2$$

**Examples**  $x^2 + 8x + 16 = (x + 4)(x + 4) = (x + 4)^2$

$$4n^2 - 12n + 9 = (2n - 3)(2n - 3) = (2n - 3)^2$$

## U3L7 - Factoring a Perfect-Square Trinomial



What is the factored form  
of  $x^2 - 12x + 36$  ?

$$\begin{aligned}x^2 - 12x + 36 &= x^2 - 12x + 6^2 \\ &= x^2 - 2(x)(6) + 6^2 \\ &= (x - 6)^2\end{aligned}$$

Write the last term as a square.

Does the middle term equal  $-2ab$ ?  
 $-12x = -2(x)(6)$  **YES**

Write as the square of a binomial.

## U3L7 - Factoring a Perfect-Square Trinomial



What is the factored form  
of  $4x^2 + 20x + 25$ ?

$$\begin{aligned}4x^2 + 20x + 25 &= (2x)^2 + 20x + 5^2 \\ &= (2x)^2 + 2(2x)(5) + 5^2 \\ &= (2x + 5)^2\end{aligned}$$

Write the first and last terms as a squares.

Does the middle term equal  $2ab$ ?  
 $20x = 2(2x)(5)$ . **YES**

Write as the square of a binomial.

# U3L7 - Factoring a Difference of Two Squares



Recall from Chapter 8-4 that  $(a + b)(a - b) = a^2 - b^2$ .

So you can factor a **difference of two squares**,  $a^2 - b^2$ , as  $(a + b)(a - b)$ .

take note

## Key Concept Factoring a Difference of Two Squares

**Algebra** For all real numbers  $a$  and  $b$ :

$$a^2 - b^2 = (a + b)(a - b)$$

**Examples**  $x^2 - 64 = (x + 8)(x - 8)$

$$25x^2 - 36 = (5x + 6)(5x - 6)$$

## U3L7 - Factoring a Difference of Two Squares



What is the factored form of  $z^2 - 9$ ?

$$z^2 - 9 = z^2 - 3^2$$

$$= (z + 3)(z - 3)$$

$$(z + 3)(z - 3) = z^2 - 3z + 3z - 9$$

$$= z^2 - 9$$

Rewrite 9 as a square.

Factor using the rule for a difference of two squares.

Check your answer by multiplying the factored form.

## U3L7 - Factoring a Difference of Two Squares



What is the factored form of  $16x^2 - 81$ ?

$$\begin{aligned}16x^2 - 81 &= (4x)^2 - 9^2 \\ &= (4x + 9)(4x - 9)\end{aligned}$$

Write each term as a square.

Use the rule for a difference of two squares.



## U3L7 - Factoring a Difference of Two Squares



What is the factored form of  $24g^2 - 6$ ?

$$\begin{aligned}24g^2 - 6 &= 6(4g^2 - 1) \\ &= 6[(2g)^2 - 1^2] \\ &= 6(2g + 1)(2g - 1)\end{aligned}$$

Factor out the GCF, 6.

Write the difference as  $a^2 - b^2$ .

Use the rule for the differences of squares.

# Questions?

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- 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.