

# Applications

## Agenda

Warm-Up

Teach Piece

Stations

HW #1,2,6

## Reminders

Test Friday

Unit 8 Notebook

Check Friday

All HW due Friday

Review answers  
will be posted on  
twitter

## Warm-Up Wednesday

Which binomial is a factor of  $24x^2 - 49x + 2$ ?

A.  $x - 2$

B.  $x - 1$

C.  $x + 1$

D.  $x + 2$

Handwritten work showing a box method for factoring  $24x^2 - 49x + 2$ . The box is divided into four quadrants with terms  $24x^2$ ,  $-48x$ ,  $-1x$ , and  $2$ . The binomial  $x - 2$  is written above the box, and  $24x - 1$  is written to the left of the box.

Handwritten factored form:  $(x - 2)(24x - 1)$

Handwritten work showing the distributive property:  $24(2) = 48$ . Below this, a list of numbers is shown:  $-1, -2, -3, 4, 6$  on the left and  $48, 24, 16, 12, 8$  on the right, with a vertical line separating them.

Handwritten note: "Add to -49" with an arrow pointing to the list of numbers.

# Applications

1. Many Texas courthouses are at the center of a town square. The area of the town square shown is  $(9x^2 - 12x + 4) \text{ ft}^2$ .

FACTO R

$$A = L \cdot W$$

- A. Find the dimensions of the town square.

$$\begin{array}{r} 3x - 2 \\ 3x \overline{) 9x^2 - 6x - 2} \\ \underline{-6x} \phantom{-2} \\ 4 \end{array}$$

$$9 \cdot 4 = 36$$

$$\begin{array}{r} 1 \phantom{00} 36 \\ 2 \phantom{00} 18 \\ 3 \phantom{00} 12 \\ 4 \phantom{00} 0 \end{array}$$

← ADD to -12

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



- B. Write an expression for the perimeter of the town square

$$\begin{array}{c} 3x-2 \\ 3x-2 \end{array} \square$$

$$4(3x-2) = 12x-8$$

↑ add all sides

- C. Solve for the perimeter of the town square when  $x = 80$  feet.

$$\begin{array}{r} 12(80) - 8 = 952 \text{ ft} \\ 960 - 8 \end{array}$$

# **Applications**

**You will work through the 5 stations. Today will be another participation grade. Your HW tonight is #1, 2, and 6 on the Applications HW. Any other questions or assignments in the 5.3 packet are BONUS!**

**HW 5.2 & 5.3 are due FRIDAY, no exceptions! Unit 8 notebook check  
FRIDAY**

# Station 1

The area of a Mac laptop screen can be modeled by the expression  $(11x^2 + 25x - 24)$  square inches. What are the dimensions for the screen?

← NO GCF

	$x$	$+3$
$11x$	$11x^2$	$33x$
$-8$	$-8x$	$-24$

$$\frac{11(-24) = -264}{33 \quad -8}$$

↑ ADD to 25

$(x+3)$  and  $(11x-8)$

# Station 2

A clothing store has a rectangular clearance section with a length that is twice the width,  $w$ . During a sale, the section is expanded to an area of  $(2w^2 + 19w + 35) ft^2$ .

no gcf

- A. Find the dimensions of the clearance area including the expanded area. **FACTOR**

$$(2w+5)(w+7)$$

- B. Find the amount of the increase in length and width of the clearance section.

	$2w+5$	
$w$	$2w^2$	$5w$
$+7$	$14w$	$35$

$$2(35)=70$$

$$\begin{array}{r} 5 \overline{) 14} \end{array}$$

Add to 19

# Station 3

Jayne needs to cut a rectangular piece of cloth to make a tablecloth. The area needed is  $(16x^2 - 24x + 9) \text{ in}^2$ . ← no gcf

- A. Find the dimensions of the cloth. (FACTOR)  
 $(4x-3)(4x-3)$  (it's square!)

- B. Jayne wants to trim the tablecloth with piping.  
 Write an expression for the perimeter of the tablecloth.

$$4(4x-3) = (16x-12) \text{ in}$$

- C. Find the perimeter of the cloth when  $x = 11$  inches.

$$16(11) - 12 = \underline{164 \text{ in}}$$

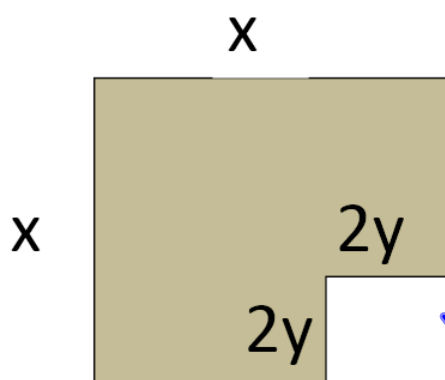
$4x$	$16x^2$	$-12x$
$-3$	$-12x$	$+9$

$$\begin{array}{r} +144 \\ -12 \end{array} \quad \begin{array}{r} -12 \end{array}$$

~ Add to -24

# Station 4

The floor plan of a daycare center is shown below. The arts and crafts area in the lower right corner is not carpeted. The rest of the center is carpeted. Choose the expression, in factored form, that best represents the area of the floor that is carpeted.



$$A_{\text{shaded}} = A_{\text{big}} - A_{\text{small}} \\ x \cdot x - (2y)(2y)$$

Try to multiply answer choices to get  $x^2 - 4y^2$

- A.  $(x+2y)^2$
- B.  $(x-2y)^2$
- C.  $(x+2y)(x-2y)$
- D.  $(2x-4y)$

# Station 5

A ball is kicked straight up in to the air. The height of the ball in feet is given by the expression  $-16t^2 + 16t + 4$  where  $t$  is time in seconds.

$$\begin{array}{r} \cancel{16} \cancel{t^2} \\ \cancel{2} \cancel{t} \quad \cancel{8} \\ \hline 4 \end{array} \quad \begin{array}{r} \cancel{16} \cancel{t} \\ \cancel{2} \cancel{t} \quad \cancel{8} \\ \hline 4 \end{array} \quad \begin{array}{r} \cancel{4} \\ \hline 4 \end{array}$$

A. Factor the expression.

$$-4(4t^2 - 4t - 1)$$

B. Find the height of the ball at 1 second.

$$-4(4(1)^2 - 4(1) - 1)$$

$$t = 1$$

$$\boxed{4 \text{ feet}}$$



# 1, 2, 4

Algebra I – Unit 8: Topic 1 – Applications of Factoring

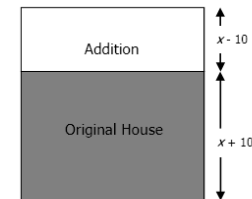
**Practice – Applications of Factoring****pp 524-571**

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

1. The Parthenon in Athens, Greece, is an ancient structure that has a rectangular base. The area of the base is modeled by the expression  $3t^2 - 11t + 10$  square meters. What are the dimensions of the base?
2. The area of a rectangular room is given as  $x^2 - 16x + 63$  square feet. If the width of room is  $(x - 7)$ , what is the length?

The figure shows the plans for an addition on the back of a house.  
Use the figure to answer questions 3-5.

3. The area of the addition is  $(x^2 + 10x - 200)$  ft<sup>2</sup>. What is its length?



4. What is the area of the original house?

5. The homeowners decide to extend the addition. The area with the addition is now  $(x^2 + 12x - 160)$  ft<sup>2</sup>. By how many feet was the addition extended?

6. The area of a soccer field is  $(6x^2 + 25x + 25)$  square meters. The width of the field is  $(2x + 5)$  meters. What is the length of the field?
7. For a certain college, the number of applications received after  $x$  recruiting seminars is modeled by the polynomial  $3x^2 + 490x + 6000$ . What is this expression in its factored form?

