Math Virtual Learning

9-12 Grades/Essential Math 4
Unit 10 Lesson 2

April 10, 2020

Learning Target:
I can use the area model to divide.

You will explore the use of area models to divide algebraic expressions.

<u>**Directions:**</u>

1. Click through the slides, following along on your own paper.

2. Watch all videos on slides.

3. Complete the tasks and problems for each slide, on a separate sheet of paper.
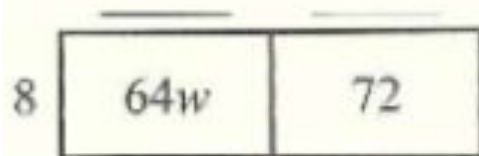
Bell Work   April 10, 2020

Area models show how to organize the multiplication of *two* factors to find their product.

When we *divide*, we start with the product and one factor, and we use division to *find the other factor* (and sometimes a remainder).

When we *factor* with an area model, we start with only the product (inside the model), and we *find two factors*.

	5j	-7
4		

(Multiplication)

|	_____	_____
8	64w	72
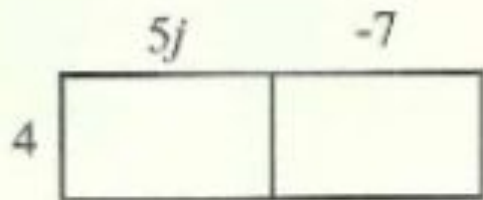
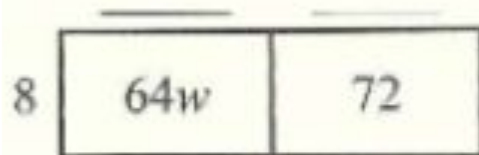(Division)

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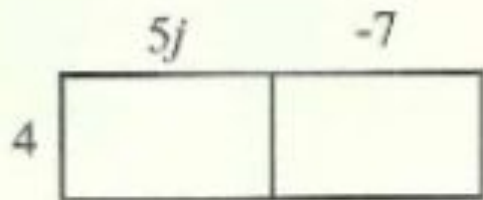
(Division)

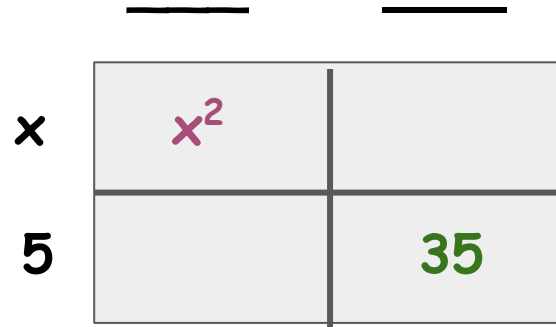# Let's Get Started:

Organize expressions in your Area Model.

Practice: Divide the expression below using an area model:

$x^2 + 12x + 35$

$x + 5$

First term (x^2) goes in the upper left box.

Last term (35) goes in the lower right box.

x | ____ | ____

x^2	
	35

5

The factors x and 5 go on the left side.

Next step:

Factor expressions using Area Model.

Practice: Divide the expression below using an area model:

$\underline{x^2 + 12x + 35}$

$x + 5$

Factor 35:
1   35
5   7

Which two add up to 12?
5 and 7

x	x^2	**7x**
5	**5x**	35

Next step

Factor expressions using Area Model.

Practice: Divide the expression below using an area model:

$\underline{x^2 + 12x + 35}$

$x + 5$

x _____
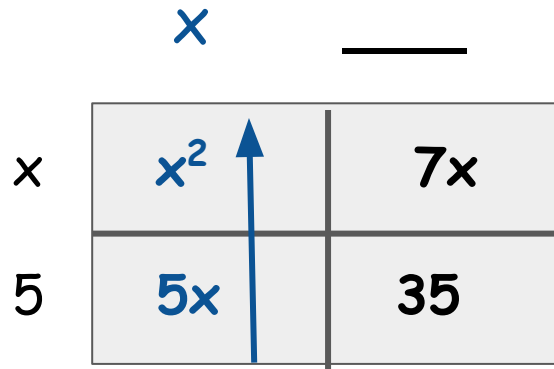
	x^2	$7x$
x		
5	$5x$	35

What do these two factors have in common?

Next step

Factor expressions using Area Model.

Practice: Divide the expression below using an area model:

$\underline{x^2 + 12x + 35}$

$\quad\quad x + 5$

	x	7
x	x^2	$7x$
5	$5x$	35

What do these two factors have in common?

Final step

Find the answer on the outside of your Area Model:

Practice: Divide the expression below using an area model:

$$\frac{x^2 + 12x + 35}{x + 5} = (x + 5)(x + 7)$$

	x	7
x	x^2	$7x$
5	$5x$	35

Practice:
Watch

1. Review and solve the problem below
2. Reminder: Like terms are terms that have the same variable raised to the same power.
3. To add like terms, add their coefficients.

Practice: Divide the expressions below using an area model:
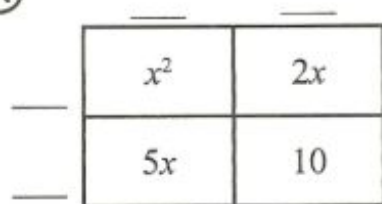
$(y^2 + 15y + 56)/(y + 7)$

Practice Problems: Unit 10 Lesson 2 page 7, 12-15
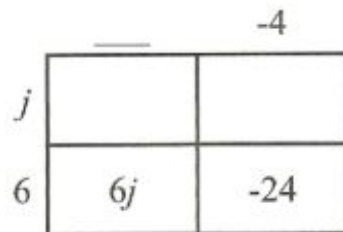
Additional Practice

Complete these area model puzzles and write either a multiplication or division equation to describe each one.
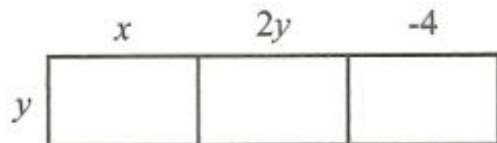
(A)

	___	___
___	x^2	$2x$
___	$5x$	10

$($ ___ $)($ ___ $) = x^2 +$ ___ $+ 10$

(B)

	___	-4
j		
6	$6j$	-24

(C)

	x	$2y$	-4
y			

(D)

	___	___
___	x^2	$7x$
___	$-6x$	-42

Complete these area model puzzles and write either a multiplication or division equation to describe each one.
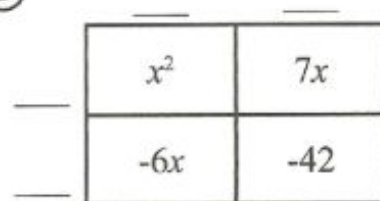
(A)

x	x	2
x	x^2	$2x$
5	$5x$	10

$(x + 5)(x + 2) = x^2 + \underline{7x} + 10$

(B)

	j	-4
j	j^2	$-4j$
6	$6j$	-24

$\dfrac{j^2 + 2j - 24}{j + 6} = j - 4$

(C)

	x	$2y$	-4
y	xy	$2y^2$	$-4y$

$\dfrac{xy + 2y^2 - 4y}{y} = x + 2y - 4$

(Responses will vary. Examples shown.)

(D)

	x	7
x	x^2	$7x$
-6	$-6x$	-42

$(x + 7)(x - 6) = x^2 + x - 42$

Additional Practice Problems: Unit 10 Lesson 2 page 7, 16-22.

(16)
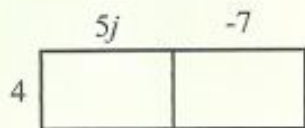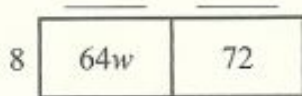
	5j	-7
4		

(Multiplication)

(17)

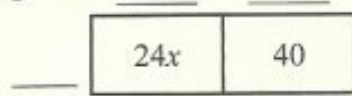|	___	___
8	64w	72

(Division)
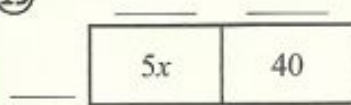
(18)

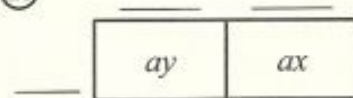|	___	___
___	24x	40

(Factoring)

Use the product shown in the area model to find two factors that could go along the outside of the model. Use your findings to write at least one equation (using multiplication or division) that is represented by the model.

(19)

	___	___
___	5x	40

(20)

	___	___
___	ay	ax

(21)

	___
___	w^2
___	7w

(22)

	___	___	___
___	$4m^2$	12m	20

Answer Key: Once you have completed the problems, check your answers.

(16)

	5j	-7
4	20j	-28

(Multiplication)

(17)

	8w	9
8	64w	72

(Division)

(18)

	3x	5
8	24x	40

(Factoring)

Use the product shown in the area model to find two factors that could go along the outside of the model. Use your findings to write at least one equation (using multiplication or division) that is represented by the model.
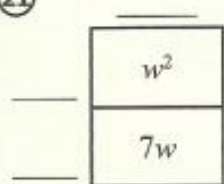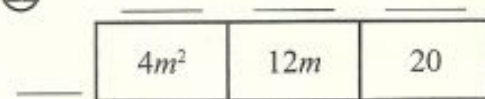
(19)

	x	8
5	5x	40

$5(x + 8) = 5x + 40$

$\dfrac{5x + 40}{5} = x + 8$

$\dfrac{5x + 40}{x + 8} = 5$

(20)

	y	x
a	ay	ax

$a(y + x) = ay + ax$

$\dfrac{ay + ax}{a} = y + x$

$\dfrac{ay + ax}{y + x} = a$

(Instructions ask for only ONE equation. Possibilities shown.)

(21)

	w
w	w^2
7	7w

$\dfrac{w^2 + 7w}{w} = w + 7$

$\dfrac{w^2 + 7w}{w + 7} = w$

$w(w + 7) = w^2 + 7w$

(22)

	m^2	3m	5
4	$4m^2$	12m	20

$\dfrac{4m^2 + 12m + 20}{4} = m^2 + 3m + 5$

Students may also use a common factor of 2: $2(2m^2 + 6m + 10) = 4m^2 + 12m + 20$