Name _____ MYP Level 4: Algebra I

Warm Up: Lesson 6: The Distributive Property Area Model

"4-Number Game"

Rules: 1.) You can only use the digits 1, 2, 3, 4
2.) You can only use each digit once (but you don't have to use every number)
3.) You can only use addition and multiplication
4.) You can NOT take the digits 1 and 2 and put them next to each other to make 12.

Come up with as many expressions as you can that equal each of the following. There may be more than one correct answer for some numbers.

Value of Expression	Expression (using 1, 2, 3, 4, +, and x)	Value of Expression	Expression (using 1, 2, 3, 4, +, and x)
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11			
12		30	
13		32	
14		36	
15			

What is the largest number that can be made in the "4-number Game"?

What if we played the "2-number Game" with 1 and 2 with the same rules? What would be the largest number you could create?

What if we played the "3-number Game" with 1, 2, and 3 with the same rules? What would be the largest number you could create?

What if we played the "5-number Game" with 1, 2, 3, 4, and 5 with the same rules? What would be the largest number you could create?

What if we played the "*n*-number Game" with 1, 2, 3, … and *n* with the same rules? What would be the largest number you could create?

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Lesson: Lesson 6: The Distributive Property Area Model

From our warm up, what are two ways to play the "4-Number Game" and have a value of 6?

If we replace these numbers with any real numbers, *a*, *b*, and *c*, will our expressions still be equivalent?

How can we draw a picture to represent our expressions above?

Let's try the same game with symbols now:

"The Symbol Game"

Rules: 1.) You can only use the symbols _____ , _____, _____, _____

2.) You **can use each digit more than once** (but you don't have to use every symbol)

3.) You **can only use addition**

4.) You can NOT take the symbols 2 and *x* and put them next to each other to make 2*x*.

1.) Create as many expressions with 2 terms (called _____) as you can.

2.) Now use your binomial expressions from #1 to create new expressions. Can you simplify these?

_____ + _____ =

_____ + _____ + _____ =

_____ + _____ + _____ + _____ =

Distributive Property- show this with algebra and a picture:

a(b + c) =

Try to represent each of the following with a picture and apply the distributive property:

1.) 5(x + 1)

2.) x(y + 6)

3.) (x + 1)(x + 6)

4.) (x + y)(x + y)

5.) (a + b)(a + b + c)

6.) (x + y)(2 + a + b)

7.) **Challenge** (a + b)(c + d)(e + f + g)

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Homework: Lesson 6: The Distributive Property Area Model

1.) Insert parentheses to make each statement true.

a. $2 + 3 \times 4^2 + 1 = 81$

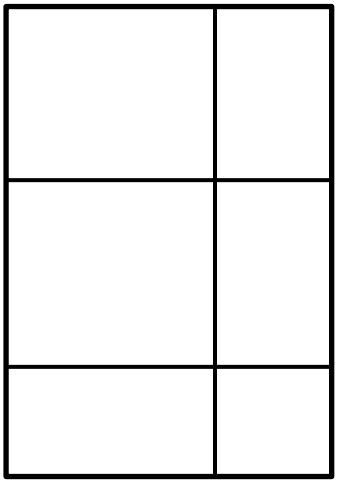
b. $2 + 3 \times 4^2 + 1 = 85$

c. $2 + 3 \times 4^2 + 1 = 51$

d. $2 + 3 \times 4^2 + 1 = 53$

2.) Leela is convinced that $(a + b)^2 = a^2 + b^2$. Do you think she is right? Use a picture to illustrate your reasoning. Hint: $(a + b)^2$ is the same as $(a + b)(a + b)$

3.) Draw picture to represent the expression $(a + b + 1)(b + 1)$. Write an equivalent expression by applying the distributive property.



4.) Draw a picture to represent the expression: $(y + 1)(x + y + 3)$.
Write an equivalent expression by applying the distributive property.

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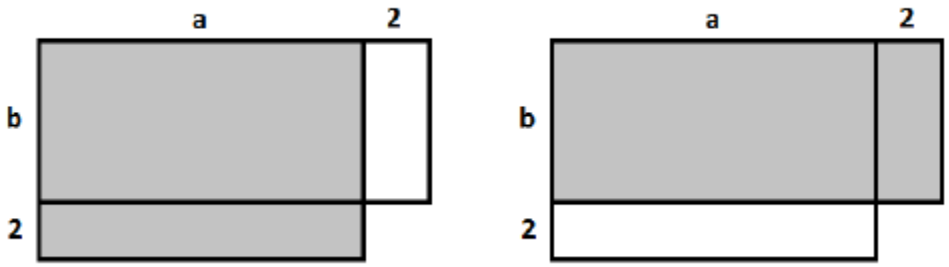
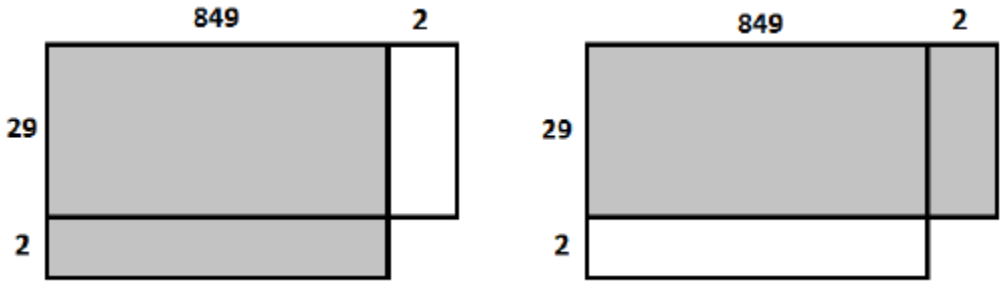
Warm Up: Lesson 6: The Distributive Property Day 2

a. Given that $a > b$, which of the shaded regions is larger and why?



b. Consider the expressions 851×29 and 849×31. Which would result in a larger product? Use a diagram to demonstrate your result



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Lesson: Applying & "Undoing" the Distributive Property

$a(b + c) =$

Let's work backwards... Now we are given what goes INSIDE the picture. We need to find the OUTSIDE of the picture.

1.) $ab + ac =$

2.) $jk + jm =$

3.) $6x + 12 =$

In Algebra, this process of "undoing" the distributive property is called _____.

Now draw your own pictures and factor each of the following:

4.) $2x + 3x =$

5.) $3xy + 9y =$

6.) $x + x =$

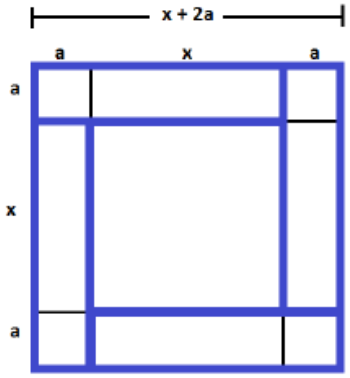
7.) $x^2 + xy + 7x =$

8.) $2a^2 + a^2b + ab =$

9.) **Consider the following diagram.**

Edna looked at the diagram and then highlighted the four small rectangles shown and exclaimed:

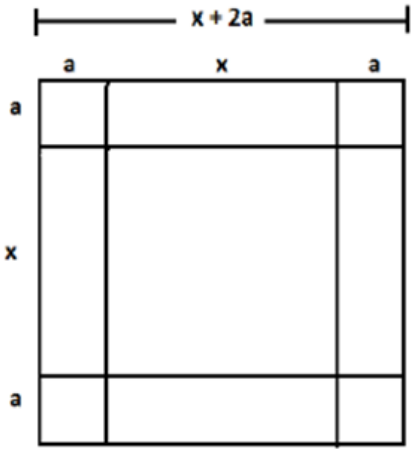
$(x + 2a)^2 = x^2 + 4a(x + a)$.



a. Michael, when he saw the picture, highlighted four rectangles and concluded:

$(x + 2a)^2 = x^2 + 2ax + 2a(x + 2a)$.

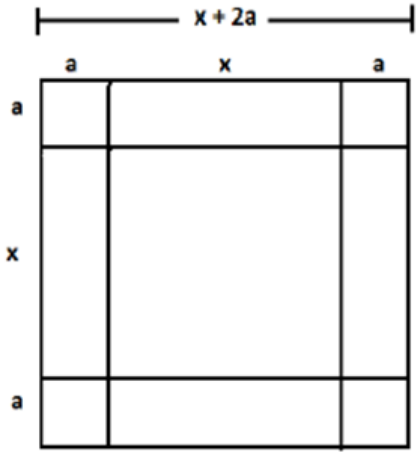
Which four rectangles and one square did he highlight?



b. Jill, when she saw the picture, highlighted eight rectangles and squares (not including the square in the middle) to conclude:

$(x + 2a)^2 = x^2 + 4ax + 4a^2$.

Which eight rectangles and squares did she highlight?



Whose techniques are correct? Why?