

# Algebra 1: Problem Set 2B

Mr. Chamberlain

Name \_\_\_\_\_

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

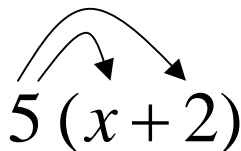
**FYI**

We have learned two ways to **simplify algebraic expressions** using the **Distributive Property** of multiplication over addition.

- 1) **Algebraic Method** Simplify:  $5(x + 2)$

Order of Operations (PEMDAS) tells us to simplify inside the parentheses first, but we cannot combine  $x$  and 2 since they are not like terms.

So, we APPLY the factor of 5 to both the  $x$  AND the 2 as follows:

$$5(x + 2)$$


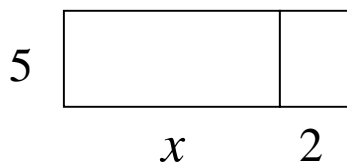
giving:

$$5(x) + 5(2)$$

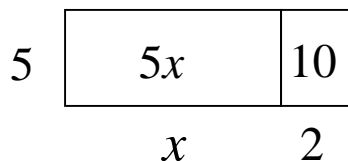
which simplifies to:

$$5x + 10$$

- 2) **Area Model Method** - The multiplication of two factors can also be modeled using a rectangle. Thus, the problem above could be shown as:



Clearly, using  $A = lw$ , the sub-areas can be calculated as follows:



So, the area of the rectangle is:  $5x + 10$

1. **Matching**

Use the distributive property to match algebraic expressions in the left-hand column with equivalent expressions in the right-hand column. The expressions in the right column have been simplified.

_____ a)	$4(x+7)$	1)	$x^2 + xy$
_____ b)	$x(x+1)$	2)	$x^2 + x$
_____ c)	$2(x-9)$	3)	$y^2 - 3y$
_____ d)	$(x+y)x$	4)	$-4x+4$
_____ e)	$3(2x+5)$	5)	$10xy$
_____ f)	$y(y-3)$	6)	$4x+28$
_____ g)	$(x+y)10$	7)	$6x+15$
_____ h)	$-4(x+1)$	8)	$10x+10y$
		9)	$2x-18$
		10)	$-4x-4$

Perform any scrap work below

*Simplify the following expressions using the distributive property.  
Show BOTH the Algebraic Method AND the Area Model Method below:*

2.  $5(x - 3)$

3.  $-5(2x - 7)$

4.  $3(x + 3) - 3(x + 3)$

5.  $5(2x - 7) - 5(x - 3)$



# Rates & Ratios Review

## Rates

The relationship  $\frac{a}{b}$  of two quantities **a** and **b** measured in **DIFFERENT** units.

For example, a car that travels 100 miles in 2 hours has an average **RATE** of speed of:  $50 \text{ miles} / 1 \text{ hour}$  or 50 miles per hour.

A **UNIT RATE** contains a single unit (quantity of one) in the denominator. **UNIT RATES** are helpful in comparisons, such as product pricing and speed.

## Ratios

A comparison of two quantities or numbers measured in the **SAME** units.

A ratio can be expressed as:

- 1)  $\frac{a}{b}$
- 2) **a:b**
- 3) **a to b**

Recipe ingredients are often expressed as ratios to a unit of measure such as a cup or tablespoon.

6. What is the ratio of 5 days to two weeks (in days)?
  
  
  
  
  
  
  
  
  
  
7. What is the average rate of speed of a car that travels 300 miles in 8 hours
  
  
  
  
  
  
  
  
  
  
8. What is the ratio of 4 inches to one foot (in inches)?
  
  
  
  
  
  
  
  
  
  
9. What is the ratio of boys to girls in this math class?

10. A 12-ounce box of Corn Flakes sells for \$2.40. A 20-ounce box sells for \$3.00.

a) Which box is the better buy? Explain your answer in terms of UNIT PRICING per ounce.

b) What would the price of the 20-ounce box be if it had the same UNIT PRICE as the 12-ounce box?

11. **DIAMOND PROBLEMS** (*This is for fun, Don't worry about this for the test!*)

Discover a pattern in the first three problems below. Use your pattern to solve the remaining diamonds.

