



ALGEBRA

Write your  
questions here!



## 2.3 Distribution

NOTES

What does it mean to distribute? Give a real world example?

Order  
of  
Operations

$$3 \times (4 + 6)$$

Distributive  
Property

$$3 \times (4 + 6)$$

Group  
First

$$8 \times (50 + 3)$$

Distributive  
Property

$$8 \times (50 + 3)$$

Multi-Digit  
Multiplication

$$\times (\text{red } 00 + \text{green } 0 + \text{purple } 7)$$

Expanded Form

$$5 \times 47$$

$$5 \times (40 + 7)$$

$$4 \cdot (-5 + \frac{1}{4} - 4.25)$$

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## Distributive Property in Algebra

$$3(2x + 5)$$

Distributive Property	When you can and cannot distribute.
$a(b+c) = ab+ac$	$a(b+c) = ab+ac$ $a(b-c) = ab-ac$ $a(b \times c) \text{ Can't Distribute}$ $a(b \div c) \text{ Can't Distribute}$

1.  $(3h+6)4$

2.  $3(5x+2) + 2x+4$

3.  $8 - 3(2m - 5)$

## Distributive law for division

$$\frac{15+6}{3} =$$

$$\frac{24}{6+2} \neq$$

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1.  $\frac{18x-12}{6}$

2.  $\frac{-20x-5}{-5}$

3.  $\frac{-4x-20}{-6}$

4.  $\frac{4x}{2x+1}$

Now,  
summarize  
your notes  
here!

Summarize your notes:

## 2.3 Distribution

### PRACTICE

### Algebra REVIEW

*Extending  
the Lesson*

**MENTAL MATH** The Distributive Property allows you to find certain products mentally. Replace one factor with the sum of a number and a multiple of ten. Then apply the Distributive Property.

**Example** Find  $15 \cdot 12$  mentally.

$$\begin{aligned} 15 \cdot 12 &= 15(10 + 2) && \text{Think: 12 is } 10 + 2. \\ &= 15 \cdot 10 + 15 \cdot 2 && \text{Distributive Property} \\ &= 150 + 30 && \text{Multiply mentally.} \\ &= 180 && \text{Add mentally.} \end{aligned}$$

Rewrite each product so it is easy to compute mentally. Then find the product.

1.  $7 \cdot 14$

2.  $8 \cdot 23$

3.  $9 \cdot 32$

4.  $16 \cdot 11$

**Rewrite each product so it is easy to compute mentally. Then find the product.**

5.  $14 \cdot 12$

6.  $9 \cdot 103$

7.  $11 \cdot 102$

8.  $12 \cdot 1004$

9.  $7(62)$

10.  $5(49)$

11.  $14(1.5)$

12.  $16(1.75)$

13.  $15(1\frac{2}{3})$

14.  $9(6.98)$

15.  $12(19.95)$

**Rewrite the expression using the distributive property.**

16.  $20(2 + 5)$

17.  $-3(4 - 8)$

18.  $(x + 6)(-2)$

19.  $(z - 10)(12)$

20.  $-6(2y - 5)$

21.  $-4(10 - b)$

22.  $-2(3 + x)$

23.  $6.5(v + 1)$

24.  $\frac{1}{2}\left(\frac{1}{2}m - 4\right)$

25.  $\frac{2}{3}(6n - 9)$

Use the property of real numbers to fill in the missing part of the statement.		
26. Distributive Property $(6 + z)5 = \square$	27. Distributive Property $-3(4 + x) = \square$	
The right side of the equation is <i>not</i> equal to the left side. Change the right side so that it <i>is</i> equal to the left side.		
28. $3(x + 5) \neq 3x + 5$	29. $4(x + 2) \neq 4x + 2$	
30. $-2(x + 8) \neq -2x + 16$	31. $-9(x + 4) \neq -9x + 36$	
True or False? Determine whether the statement is true or false. Justify your Answer		
32. $6(7 + 2) = 6(7) + 2$	33. $-4(8 + 1) = -4(8) - 4(1)$	
Mr. Brust tried to simplify the following but a made a really common mistake in each problem. Help a math teacher out by circling his mistake, and then show the correct solution.		
34. $8 + 2(3p + 1)$ $10(3p + 1)$ $30p + 10$	35. $3d - 2(d - 4)$ $3d - 2d - 8$ $1d - 8$	
Simplify the expression using the distributive property and combining like terms.		
36. $6y + 2(y + 1)$	37. $2(4a - 1) + a$	38. $6r - 2(r + 4)$
39. $3(m + 5) - 10$	40. $5.5(w - 3) + 3w$	41. $(s - 3)(2) + 17s$

42.  $\frac{1}{3}(2m + 6) - 10$

43.  $\frac{1}{2} + 3\left(2u + \frac{1}{6}\right)$

44. Justify the steps in the simplification of this expression.

$$2m - (8 - 4m) + 5$$

## Algebra REVIEW

### Extending the Lesson

**MENTAL MATH** The Distributive Property allows you to find certain quotients mentally. Replace the top factor with its sum (broken up by place value) then apply the Distributive Property.

Example:  $\frac{237}{2} = \frac{200+30+6+1}{2}$   
 $= 100 + 15 + 3 + \frac{1}{2}$

**Rewrite each quotient so it is easy to compute mentally. Then simplify.**

45.  $\frac{647}{5}$

46.  $\frac{359}{2}$

47.  $\frac{725}{6}$

48.  $\frac{235}{3}$

**Simplify the expression. Reduce fractions when possible. Leave answers as improper fractions.**

49.  $\frac{6x-14}{2}$

50.  $\frac{9z-6}{-3}$

51.  $\frac{-6p+15}{6}$

52.  $\frac{-10-24a}{-8}$

53.  $\frac{36-27c}{9}$

<b>SKILLS REVIEW</b>  Name the property of real number that justifies the statement.		Commutative = Com. Associative = Assoc. Identity = Ind. Inverse = Inv. Distributive = Distrib.	
1. $(8 - 5)(10) = 8 \cdot 10 - 5 \cdot 10$		2. $(16 + 8) - 5 = 16 + (8 - 5)$	
3. $5(2a) = (5 \cdot 2)a$	4. $3 + (12 - 9) = (3 + 12) - 9$	5. $10(2x) = (10 \cdot 2)x$	
6. $2(6 \cdot 3) = (2 \cdot 6)3$	7. $(5 + 10)(8) = 8(5 + 10)$	8. $(-4 \cdot 10) \cdot 8 = -4(10 \cdot 8)$	
9. $(6 + x) - m = 6 + (x - m)$		10. $7(9 + 15) = 7 \cdot 9 + 7 \cdot 15$	
11. $(10 + 8) + 3 = 10 + (8 + 3)$		12. $(x + 1) - (x + 1) = 0$	
13. $3(6 + b) = 3 \cdot 6 + 3 \cdot b$		14. $3(2 + x) = 3 \cdot 2 + 3x$	

## 2.3 Distributive Property

## APPLICATION

Simplify

1.  $\frac{2}{5}(10m - 15)$

2.  $3 + 2(b - 4)$



3. Which equation is always true?

☐ A  $5(a + b) = 5a + b$

☐ B  $5(ab) = (5a)(5b)$

☐ C  $5(a + b) = 5(b + a)$

☐ D  $5(a + 0) = 5a + 5$

4. One ticket to a baseball game costs  $t$  dollars. A soft drink costs  $s$  dollars. Which expression represents the total cost of a ticket and soft drink for  $p$  people?

☐ A  $pst$

☐ B  $p + (ts)$

☐ C  $t(p + s)$

☐ D  $p(t + s)$

5. Rewrite using the distributive property.  $-4x - 16$

6. Evaluate using the distributive property (No Calculator):  $88 \times 7 - 82 \times 7$

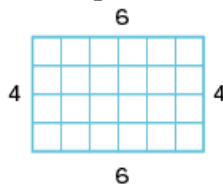
7. You work in an industry where the wage is \$12 per hour with “time and a half” for over time. Find your hourly wage for overtime.
8. **ENTERTAINMENT** Suppose you pay \$15 per hour to go horseback riding. You ride 2 hours today and plan to ride 4 more hours this weekend.
- Write two different expressions to find the total cost of horseback riding.
  - Find the total cost.
9. **LOOK BACK at unit 1 section 2:**
- Translate the verbal phrase “twice the sum of a number and 2” into an algebraic expression.
  - Use the distribution property to write the algebraic expression a different way.
  - Write a new verbal phrase to describe the algebraic expression you wrote in part b.

### Area and Perimeter of a Rectangle

#### Geometry Review (Part 1)

#### Extending the Lesson

#### Example



Perimeter = 20 units

Area = 24 square units

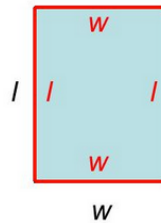
#### Formula

#### RECTANGLE

length  $l$  and width  $w$

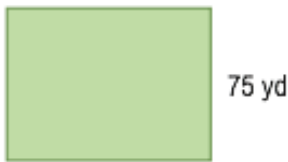
$$P = 2l + 2w$$

$$A = lw$$



Find the area of each rectangle below

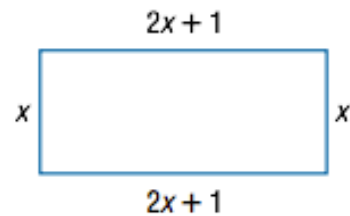
10. 100 yd



11. 48 m

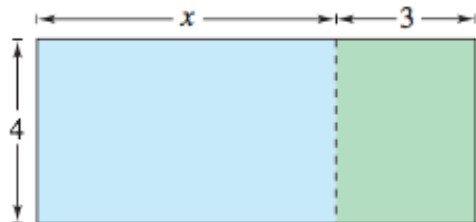


12. Write an algebraic expression.



**GEOMETRY** The figure shows two adjoining rectangles. Find the total area of the rectangles in two ways.

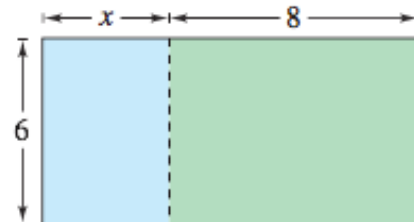
13.



1<sup>st</sup> way –

2<sup>nd</sup> way –

14.



1<sup>st</sup> way –

2<sup>nd</sup> way –