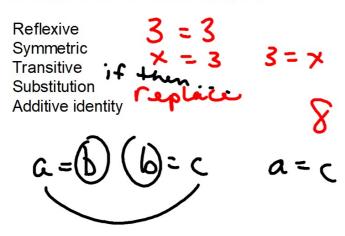
Alg 1 1.3
Recognize the properties of equality and identity.
Recognize the associative property



Property	Words	Symbols	Examples
Reflexive Property	Any quantity is equal to itself.	For any number $a$ , $a = a$ .	5 = 5 4 + 7 = 4 + 7
Symmetric Property	If one quantity equals a second quantity, then the second quantity equals the first.	For any numbers $a$ and $b$ if $g = b$ , the $b = a$ .	If $8 = 2 + 6$ , then $2 + 6 = 8$ .
Transitive Property	If one quantity equals a second quantity and the second quantity equals a third quantity, then the first quantity equals the third quantity.	For any numbers $c$ , and $c$ , $c = b$ and $b = c$ , then $a = c$ .	If 6 + 9 = 3 + 12 and 3 + 12 = 15, th 6 + 9 = 15.
Substitution Property	A quantity may be substituted for its equal in any expression.	If $a = b$ , then $a$ may be replaced by $b$ in any expression.	If $n = 11$ then $4n = 4 \cdot 11$

8=2+6

Property	Words	Symbols	Examples
Additive Identity	For any number a, the sum of a and 0 is a.	a + 0 = 0 + a = a	2 + 0 = 2 0 + 2 = 2
Additive Inverse	A number and its opposite are additive inverses of each other,	$a+\langle -a\rangle=0$	3 + (-3) = 0 4 - 4 = 0

4+0=4 3+?=3 -5+5=0

## opposite -> zero poir

Words The way you group three or more numbers when adding or multiplying does not change their sum or product.

Symbols For any numbers a, b, and c, (a+b)+c=a+(b+c) and (ab)c=a(bc).

Examples (3+5)+7=3+(5+7)  $(2\cdot6)\cdot9=2\cdot(6\cdot9)$  2+3)+5=10  $2\cdot(5\cdot4)=40$   $2\cdot5\cdot4=40$   $2\cdot5\cdot4=40$ 

Party Supplies			
ltem	Cost (\$)		
balloons	6.75		
decorations	14.00		
food	23.25		
beverages	20.50		

Real-World Example 2 Apply Properties of Numbers

PARTY PLANNING Eric makes a list of items that he needs to buy for a party and their costs. Find the total cost of these items.

## GeMA **Check Your Understanding**

= Step-by-Step Solutions begin on page R13.



Example 1 Evaluate each expression. Name the property used in each step.

$$(2)$$
 6 + 4(19 - 15)

3. 
$$5(14-5)+6(3+7)$$

1. (1 ÷ 5)5 · 14

2 6 + 4(19 - 15)

3. 5(14 - 5) + 6(3 + 7)

4. FINANCIAL LITERACY Carolyn has 9 quarters, 4 dimes, 7 nickels, and 2 pennies, which can be represented as 9(25) + 4(10) + 7(5) + 2. Evaluate the expression to find how much money she his Name the property less d in each apply Sub

1. 
$$(1+5)$$
5wh,  $\frac{1}{5}$ :5.14
8wh,  $\frac{1}{5}$ :70
8wh 14

Evaluate each expression using the properties of numbers. Name the property used in each step.

**6.** 
$$2.75 + 3.5 + 4.25 + 1.5$$

8. 
$$\frac{1}{4} \cdot 24 \cdot \frac{2}{3}$$

Evaluate each expression. Name the property used in each step.

$$93(22 - 3 \cdot 7)$$

9 
$$3(22-3\cdot7)$$
  
11.  $\frac{3}{4}[4\div(7-4)]$ 

**13.** 
$$2(3 \cdot 2 - 5) + 3 \cdot \frac{1}{3}$$

**10.** 
$$7 + (9 - 3^2)$$

**10.** 
$$7 + (9 - 3^2)$$
  
**12.**  $[3 \div (2 \cdot 1)] \frac{2}{3}$ 

**14.** 
$$6 \cdot \frac{1}{6} + 5(12 \div 4 - 3)$$