

The identity property states that the sum of a number  $a$  and 0 is  $a$ . The number 0 is the **additive identity**. The inverse property states that the sum of a number  $a$  and its opposite is 0. The opposite of  $a$  is its **additive inverse**.

### EXAMPLE 3 Identify properties of addition

Statement	Property illustrated
a. $(x + 9) + 2 = x + (9 + 2)$	Associative property of addition
b. $8.3 + (-8.3) = 0$	Inverse property of addition
c. $-y + 0.7 = 0.7 + (-y)$	Commutative property of addition



### EXAMPLE 4 TAKS REASONING: Multi-Step Problem

**BUSINESS** The table shows the annual profits of two piano manufacturers. Which manufacturer had the greater total profit for the three years?

Year	Profit (millions) for manufacturer A	Profit (millions) for manufacturer B
1	-\$5.8	-\$6.5
2	\$8.7	\$7.9
3	\$6.8	\$8.2



#### Solution

**STEP 1** Calculate the total profit for each manufacturer.

Manufacturer A:	Manufacturer B:
Total profit = $-5.8 + 8.7 + 6.8$	Total profit = $-6.5 + 7.9 + 8.2$
= $-5.8 + (8.7 + 6.8)$	= $-6.5 + (7.9 + 8.2)$
= $-5.8 + 15.5$	= $-6.5 + 16.1$
= 9.7	= 9.6

**STEP 2** Compare the total profits:  $9.7 > 9.6$ .

▶ Manufacturer A had the greater total profit.

#### ANOTHER WAY

You can also find the sums by adding from left to right, as shown for manufacturer A:  
 $-5.8 + 8.7 + 6.8 =$   
 $2.9 + 6.8 = 9.7.$



### GUIDED PRACTICE for Examples 2, 3, and 4

Find the sum.

5.  $-0.6 + (-6.7)$       6.  $10.1 + (-16.2)$       7.  $-13.1 + 8.7$

Identify the property being illustrated.

8.  $7 + (-7) = 0$       9.  $-12 + 0 = -12$       10.  $4 + 8 = 8 + 4$

11. **WHAT IF?** In Example 4, suppose that the profits for year 4 are  $-\$1.7$  million for manufacturer A and  $-\$2.1$  million for manufacturer B. Which manufacturer has the greater total profit for the four years?