

### 8.3 Use Properties to Solve Expressions

Let's use properties to solve expressions

Write down what you know about each of these properties.

**Associative**

**Commutative**

**Distributive**

How might you use these properties to help you simplify expressions?

Let's look at an example

Multiply  $2(x+4) + 3x + 9$  →  $2 \cdot x = 2x$   
 $2 \cdot 4 = 8$

First Step: Use the distributive property

Second Step: Use the commutative property

Third Step: Use the associative property

Fourth Step: Combine Like Terms

$2x + 8 + 3x + 9$

$2x + 3x + 8 + 9$

$(2x + 3x) + (8 + 9)$

$5x + 17$

Combine like terms  
 • Just numbers  
 • number with same letter  
 • Same letters

can't solve any further  
 this is our answer

You try

a.  $3z + 2 + 4(y + 7)$   
 $3z + 2 + 4y + 28$   
 $3z + 4y + 30$

$28 + 2 = 30$

c.  $4a + 7(b + a) - 11 + 6b$   
 $4a + 7b + 7a - 11 + 6b$   
 $11a + 13b - 11$

b.  $3(2y + 6) + y + 9$   
 $6y + 18 + y + 9$   
 $7y + 27$

$2y + 6y = 8y$   
 $18 + 9 = 27$

d.  $2y + 3x + 4 + 5x + 9y + 8$   
 $11y + 8x + 12$