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## **Basic Number Properties**

# **Basic Number Properties of Addition**

**Commutative property of addition:** When two numbers are added, the sum is the same regardless of the order of addition. For example: 5 + 4 = 4 + 5

Associative property of addition: When three or more numbers are added, the sum is the same regardless of the order of addition. For example: (3 + 4) + 6 = 3 + (4 + 6)

### Example 1

What property is expressed in the following equation? 39 + 66 = 66 + 39

**Explanation** 

We are interchanging two numbers, therefore commutative property is shown.

### Example 2

What property is expressed in the following equation? 146 + 138 + 54 = 138 + (146 + 54)

#### **Explanation**

First 146 + 138 + 54 = 138 + 146 + 54, we are interchanging two numbers, therefore commutative property is applied.

Second 138 + 146 + 54 = 138 + (146 + 54), to simplify the calculation, we are re-grouping the numbers of the problem; therefore it is the associative property being applied.

### **Example 3**

Fill in the missing number according to the associative property of addition. 213 + 39 + 61 = 213 + (\_\_\_\_ + \_\_\_)

**Explanation** 

#### 213 + 39 + 61 = 213 + (39 + 61)

We are regrouping the numbers in the problem and the sum is same regardless. Therefore associative property is applied.

# Example 4

Use the number properties to simplify the calculation: 147 + 316 + 353

# • Explanation

Adding 147 and 353 would yield a number that is multiple of 100. Therefore we apply the associative property to group them together.

```
147 + 316 + 353
= 147 + 353 + 316
= 500 + 316
```

= 816

### Example 5

Use the number properties to solve: 48 + 158 + 42 + 152

**Explanation** 

When we look at the patterns of the 4 numbers, they add up to equal 200 if we regroup them.

$$48 + 158 + 42 + 152$$

$$200$$

$$200$$

$$200$$
If we can regroup numbers  
resulting multiple of  
10, 100, etc, that would  
simplify the calculation.
$$48 + 158 + 42 + 152$$

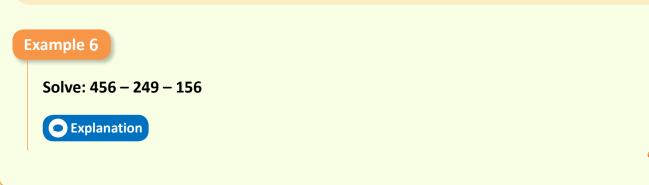
$$= 48 + 152 + 42 + 158$$
Commutative property is applied.  
$$48 + 152 + 42 + 158$$

$$= (48 + 152) + (42 + 158)$$
Associative property is applied.  
$$= 200 + 200$$

$$= 400$$

Strategies involved with subtraction:

Regrouping subtrahends, the difference remains the same: a - b - c = a - c - bSubtracting two numbers is equal to subtracting the sum of two: a - b - c = a - (c + b)



456 - 249 - 156 = 456 - 156 - 249 = 300 - 249 = 51

Example 7

Solve: 397 – 154 – 46

**Explanation** 

397 - 154 - 46

= **397** – **(154** + **46)** 

= 397 – 200

= 197

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