HOW TO . . .

Commutative Property of Addition and Multiplication

Addition and multiplication are commutative: they work forward or backward. A way to remember this property is that the word *commutative* sounds like the word *commute* – to go back and forth.

The **Commutative Property of Addition** states that changing the order of addends does not change the sum. So a + b = b + a.

For example: 27 + 64 + 13

You can switch the order of 64 and 13.

Then you can use mental math to add 27 and 13.

27 + 64 + 13 = 27 + 13 + 64

= 40 + 64

27 + 64 + 13 = 104

The **Commutative Property of Multiplication** states that changing the order of factors does not change the product. So ab = ba.

For example:

2 · 44 · 50 = 2 · 50 · 44

= 100 · 44

= 4,400

2 · 44 · 50 = 4,400

The commutative, associative, and distributive properties of mathematics make it possible to perform many functions in your head. Any time you can use mental math, computation becomes easier! Use these properties whenever you can.

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Associative Property of Addition and Multiplication

The Associative Property states that you can change the groupings of addends or factors without changing the resulting answer. You can remember this property by remembering that you *associate* with different groups of friends.

The **Associative Property of Addition** states that changing the groupings of addends does not change the sum.

For example:

514 + 72 + 18 = 514 + (72 + 18) Associating 72 with 18 first is easier.

= 514 + 90

= 604

514 + 72 + 18 = 604

The **Associative Property of Multiplication** states that changing the grouping of factors does not change the product.

For example:

83 · 25 · 4 = 83 · (25 · 4)

= 83 · 100

= 8,300

83 · 25 · 4 = 8,300

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HOW TO . . .

Distributive Property

The Distributive Property lets you break an operation into parts that work easily together. When you *distribute* something, you break it into parts.

The **Distributive Property** states that for any numbers x, y, and z

$x \cdot (y + z) = (xy) + (xz)$ *or* $x \cdot (y - z) = (xy) - (xz)$

For example:

$8 \cdot 72 = 8 \cdot (70 + 2)$

$= (8 \cdot 70) + (8 \cdot 2)$

$= 540 + 16$

$= 556$

$8 \cdot 72 = 556$

The commutative, associative, and distributive properties of mathematics make it possible to perform many functions in your head. Any time you can use mental math, computation becomes easier! Use these properties whenever you can.