Properties of Multiplication

M4N7 Students will explain and use properties of the four arithmetic operations to solve and check problems.

c. Compute using the commutative, associative, and distributive properties.

**commutative property of multiplication**: the order of the factors does not change a product.

Example: \(2 \times 4 = 4 \times 2\)

\[8 = 8\]

**associative property of multiplication**: the way factors are grouped does not change the product.

Example: \((2 \times 3) \times 4 = 2 \times (3 \times 4)\)

\[6 \times 4 = 2 \times 12\]

\[24 = 24\]

**multiplicative identity property**: any number multiplied by one remains the same number.

Example: \(5 \times 1 = 5\) or \(1 \times 5 = 5\)

**distributive property of multiplication**: multiplying a sum by a number is the same as multiplying each addend by the number and then adding the problem.

Example: \(2 \times (3 + 4) = (2 \times 3) + (2 \times 4)\)

\[2 \times 7 = 6 + 8\]

\[14 = 14\]

Example: \(432 \times 4 = (400 \times 4) + (30 \times 4) + (2 \times 4)\)

\[1,728 = 1,600 + 120 + 8\]

\[1,728 = 1,728\]

**zero property of multiplication**: any number multiplied by zero will result in the product of zero.

Example: \(5 \times 0 = 0\) or \(0 \times 5 = 0\)