

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.

$$\begin{aligned}\text{Example: } 2 \times 4 &= 4 \times 2 \\ 8 &= 8\end{aligned}$$

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

$$\begin{aligned}\text{Example: } (2 \times 3) \times 4 &= 2 \times (3 \times 4) \\ 6 \times 4 &= 2 \times 12 \\ 24 &= 24\end{aligned}$$

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

$$\text{Example: } 5 \times 1 = 5 \quad \text{or} \quad 1 \times 5 = 5$$

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.

$$\begin{aligned}\text{Example: } 2 \times (3 + 4) &= (2 \times 3) + (2 \times 4) \\ 2 \times 7 &= 6 + 8 \\ 14 &= 14\end{aligned}$$

$$\begin{aligned}\text{Example: } 432 \times 4 &= (400 \times 4) + (30 \times 4) + (2 \times 4) \\ 1,728 &= 1,600 + 120 + 8 \\ 1,728 &= 1,728\end{aligned}$$

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

$$\text{Example: } 5 \times 0 = 0 \quad \text{or} \quad 0 \times 5 = 0$$