Integers: Multiplication

Multiplying with like signs

When multiplying two integers, **if the signs of the two integers are the same**, the product will be **positive**.

A positive integer times a positive integer results in a positive integer.

A negative integer times a negative integer results in a positive integer.

Examples:

$5 \cdot 9 = 45$ $(-3) \cdot (-5) = 15$

TRY: $6 \cdot 8 =$ _____ $(-7) \cdot (-9) =$ _____

Multiplying with different signs

When multiplying two integers, **if the signs of the two integers are different**, the product will be **negative**.

A positive integer times a negative integer results in a negative integer.

A negative integer times a positive integer results in a negative integer.

Examples:

$(-3) \cdot 7 = -21$ $8 \cdot (-5) = -40$

TRY: $(-7) \cdot 6 =$ _____ $8 \cdot (-6) =$ _____

The product of any integer and 0 is 0. Example: $5 \cdot 0 = 0$ $-5 \cdot 0 = 0$

The product of any integer and 1 is that integer. Example: $5 \cdot 1 = 5$ $-5 \cdot 1 = -5$

Caution – Be careful when working with exponents. It makes a difference if the negative sign is included with the base inside the parenthesis or not included.

$$(-3)^2 = (-3) \cdot (-3) = 9 \qquad -3^2 = -(3 \cdot 3) = -9$$

Remember the Order of Operations – it applies to integers as well. **P**lease **E**xcuse **M**y **D**ear **A**unt **S**uz

P E M D A S	1. "P" If parentheses or other grouping symbols such as braces or brackets are present in the expression, evaluate what is in these grouping symbols first. 2. "E" Evaluate all expressions with exponents next. 3. "M, D" Complete any multiplication or division in order, working from left to right. 4. "A, S" Complete any addition or subtraction in order, working from left to right.

Example:	$6 - 3(2^2-7)$	Evaluate the ( ) first. Inside it is an exponent to evaluate. $2^2 = 4$
	$6 - 3(4-7)$	Evaluate the ( ) expression. $(4-7) = -3$
	$6 - 3(-3)$	Complete the multiplication: $3(-3) = -9$
	$6 - (-9)$	Complete the subtraction: $6 - (-9)$ is $6 + (+9) = 15$
	15	Final answer.

TRY:

1) $6 \cdot (-3)$ _____	12) $(-10)^2 \cdot 6$ _____
2) $7 \cdot 6$ _____	13) $11 \cdot (-5)$ _____
3) $(-6) \cdot 6$ _____	14) $8 \cdot 7$ _____
4) $8 \cdot 0$ _____	15) $(-9)^2$ _____
5) $(-7) \cdot (-7)$ _____	16) $-3(-4+8)$ _____
6) $8(-2 - 5)$ _____	17) $-(9)^2$ _____
7) $-5+ (-5)(3)$ _____	18) $(-6) \cdot 12$ _____
8) $(-6) \cdot 8$ _____	19) $(-4) \cdot (-7)$ _____
9) $(-12) \cdot 1$ _____	20) $(-5) \cdot 7$ _____
10) $7 \cdot (-9)$ _____	21) $-6^2 - 2^2$ _____
11) $(-3) \cdot (-8)$ _____	22) $-7^2 - (-2)^2$ _____

Order of Operations is SO important; here are three more to …

TRY:

$3\,(1 + 3)^2 \div 4 \cdot 2 =$

$14 - 8 \div 2 \cdot 3 \div 2 + 2 =$

$10 - 4\,[\,-\,(\,2 + 1\,)\,] \div 2\,(-\,3 + 2\,) =$