

Evaluate

$$-5 + (-12) - 8$$

Multiplication of Integers

Learning Goal:

By the end of this lesson, I will be able to multiply combinations of positive and negative integers.

Multiplication is a Shortcut for Repetitive Addition

$$4 + 4 + 4 + 4 + 4 =$$

Multiplication is frequently represented using an **AREA Model**

$$(3)(2) =$$



This can be expressed as "three groups of two" OR "two groups of three".

$$2 + 2 + 2 \quad \text{or} \quad 3 + 3$$

"Eight times three" can be represented by the following:

$$(8)(3)=$$



This can be expressed as "three groups of eight" OR "eight groups of three".

$$8 + 8 + 8 \quad \text{or} \quad 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$$

Multiply 6×13 please, using any method you are most comfortable with (no calculator).

Method One - Area Model

$$(6)(13)=$$



Method Two - traditional / algorithm

$$\begin{array}{r} 13 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ \times 6 \\ \hline \end{array}$$

Multiply the following using the Area Model, break the numbers down to whatever suits YOU best.

$$(12)(15)=$$



Multiply the following using the Area Model with a different breakdown of the numbers involved.

$$(12)(15)=$$



When using the Area Model to multiply large numbers, break the numbers down to smaller values that you are more comfortable with.

$$(26)(72)=$$



Does the order of multiplication matter?

$$(2)(3)=6$$

$$(3)(2)=6$$

Does the order of multiplication matter?

$$(2)(3)(4)=$$

$$(4)(2)(3)=$$

$$(3)(4)(2)=$$

Using positive and negative values with multiplication and division. (pattern explanation)

$$(3)(5) =$$

$$(3)(4) =$$

$$(3)(3) =$$

$$(3)(2) =$$

$$(3)(1) =$$

$$(3)(0) =$$

$$(3)(-1) =$$

$$(3)(-2) =$$

What does the following mean?

$$(3)(-1)=$$

*



What does the following mean?

$$(8)(-2)=$$



Note the pattern.

Summary for multiplication

$$(-2)(5) =$$

$$(-2)(4) =$$

$$(-2)(3) =$$

$$(-2)(2) =$$

$$(-2)(1) =$$

$$(-2)(0) =$$

$$(-2)(-1) =$$

$$(-2)(-2) =$$

$$(+)(+) = (+)$$

$$(+)(-) = (-)$$

$$(-)(-) = (-)$$

Do you see a pattern in the following?

$$(-2)(5) =$$

$$(-2)(5)(-1) =$$

$$(-2)(5)(-1)(-1) =$$

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$$(-2)(5)(-1)(-1)(-1)(-1)(-1) =$$

$$(-2)(5)(-1)(-1)(-1)(-1)(-1)(-1) =$$

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An "odd" number of negative signs in a multiplication or division problem lead to a negative answer.

An "even" number of negative signs in a multiplication or division problem lead to a positive answer.

Consolidation Questions:

Task - Integer Multiplication

Attachments

Math - task2 - mult_div_integers.doc