

TOPIC: MULTIPLYING INTEGERS

Multiplying Two Integers

◆ Recall: Multiplication is *repeated addition* & can be represented by different notations: $\times \cdot ()$

► When multiplying **integers**, the _____ of factors being multiplied affect the *sign* of the product.

EXAMPLE

Multiply the integers.

(A) $3 \cdot 6$

New

$$(+) (+) =$$

(B) $3 \cdot (-6)$

New

$$(+)(-) =$$

$$(-)(+) =$$

(C) $-3 \cdot (-6)$

$$3 \cdot (-6) = -18$$

$$2 \cdot (-6) = -12$$

$$1 \cdot (-6) = -6$$

$$0 \cdot (-6) = 0$$

$$-1 \cdot (-6) =$$

$$-2 \cdot (-6) =$$

$$-3 \cdot (-6) =$$

New

$$(-)(-) =$$

◆ Multiplying two integers of the **same** sign results in a _____. Multiplying two of **opposite** signs results in a _____.

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PRACTICE

Find the product.

(A) $(-5) \cdot 3$

(B) $(-7)(-4)$

(C) -9×0

Recall

Same Sign

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

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

Different Signs

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

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

(Mult. Sign Rules)

PRACTICE

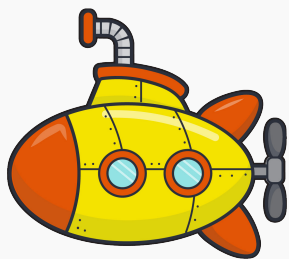
Write the phrase as a mathematical expression, then simplify.

(A) 6 times -11

(B) The product of -7 and 8

PRACTICE

A submarine descends 85 ft every minute for 4 minutes. What is its change in elevation?



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Multiplying More Than Two Integers

◆ Recall: Multiplication is commutative & associative, so we can multiply #s in *any* order. We'll often go left to right.

EXAMPLE

Multiply the following.

(A) $3(-2)(-7)$

(B) $(-6)(-5)(-2)$

(C) $(-4)(-3)(-2)(-1)$

Recall

Same Sign

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

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

Different Signs

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

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

(Mult. Sign Rules)

◆ When multiplying an [**EVEN** | **ODD**] number of *negative* integers, the product is [**POSITIVE** | **NEGATIVE**].

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PRACTICE

Multiply the following.

(A) $(-3)(4)(-2)$

(B) $(-2)(-5)(-3)(4)$

(C) $6 \cdot 4 \cdot 0 \cdot (-1)$

Recall

Multiplying an...

EVEN # of *negative* integers → **POSITIVE** product

ODD # of *negative* integers → **NEGATIVE** product

PRACTICE

Multiply the following.

(A) $10(4)(-1)$

(B) $(-1)(-1)(-1)(-1)$

EXAMPLE

John spends \$7 each day for 5 days out of the week purchasing coffee each morning. What is the total change in John's money after 2 weeks?

TOPIC: MULTIPLYING INTEGERS**TOPIC RESOURCE: Properties of Multiplication**

PROPERTIES OF MULTIPLICATION			
Name	Description	Rule	Example
<i>0 Property</i>	The product of 0 and any number is 0.	$a \cdot 0 = 0$ $0 \cdot a = 0$	$5 \cdot 0 = 0$ $0 \cdot 5 = 0$
<i>1 Property</i>	The product of 1 and any number is that same number.	$a \cdot 1 = a$ $1 \cdot a = a$	$5 \cdot 1 = 5$ $1 \cdot 5 = 5$
<i>Commutative Property</i>	Changing order of factors does not change their product.	$a \cdot b = b \cdot a$	$5 \cdot 8 = 40 = 8 \cdot 5$
<i>Associative Property</i>	Changing grouping of factors does not change their product.	$a(b \cdot c) = (a \cdot b)c$	$5(8 \cdot 2) = (5 \cdot 8) \cdot 2$
<i>Distributive Property</i>	Multiplication distributes over addition .	$a(b + c) = a \cdot b + a \cdot c$	$5(8 + 2) = 5 \cdot 8 + 5 \cdot 2$
<i>Same Sign</i>	Multiplying 2 integers with the same sign results in a positive .	$(+)(+) = +$	$3(6) = 18$
		$(-)(-) = +$	$(-3)(-6) = 18$
<i>Different Signs</i>	Multiplying 2 integers with different signs results in a negative .	$(+)(-) = -$	$3(-6) = -18$
		$(-)(+) = -$	$(-3)(6) = -18$
<i>Multiplying >2 Integers</i>	Multiplying an even number of <i>negative</i> integers results in a positive product	$(-)(-) = +$ $(-)(-)(-)(-) = +$...	$3(-6)(-2) = 36$
	Multiplying an odd number of <i>negative</i> integers results in a negative product	$(-)(-)(-) = -$ $(-)(-)(-)(-)(-) = -$...	$(-3)(-6)(-2) = -36$