

Warm-up

1. Find the difference.

a) $-65 - (+59)$

$$-65 + 59$$

$$\textcircled{-6}$$

b) $3/4 - (+9/4)$

$$\frac{3}{4} + \frac{9}{4} = \frac{12}{4}$$

$$= \textcircled{3}$$

c) $15 - |-6|$

$$15 + \overline{6}$$

$$\textcircled{9}$$

2. Find the sum.

a) $-13 + (-6)$

$$\textcircled{-19}$$

b) $-4 + 6$

$$\textcircled{2}$$

3. Evaluate the function $y = x - 8$ for the values of x : -2, -1, 0, and 1, using a table.

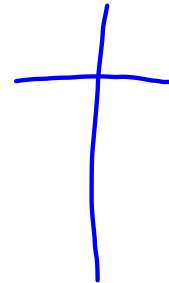
$$-2 - 8 = -10$$

$$-1 - 8 = -9$$

$$0 - 8 = -8$$

$$1 - 8 = -7$$

X	Y
-2	-10
-1	-9
0	-8
1	-7



Homework Questions?

$$2 - 7 = -5$$

$$7 - 2 = 5$$

On the top of your paper (by your name) rate yourself for this section:

4 - I can summarize the concepts and explain it to others

3 - I can apply the concept to answer questions correctly

2 - I can apply the concepts but with some mistakes

1 - I need help and know how to apply the concept

0 - I can't apply the concept, even with help

Rating of 0-2 is a warning signal to me that you need help

2.5 Multiplication of Real Numbers

- Goals:**
- Multiply real numbers using properties of multiplication.
 - Multiply real numbers to solve real-life problems.

EQ: How can you determine if the answer of a product is going to be positive or negative?

×
pos.
neg.

The Unit Organizer NAME _____
DATE _____

④ BIGGER PICTURE Algebra 9/Algebra 9 Concepts

② LAST UNIT Experience None	① CURRENT UNIT Properties of Real Numbers	③ NEXT UNIT Experience Solving Linear Equations
⑧ Student Activities or Assignments 2.1 2.2 2.3 2.5 2.6	⑤ UNIT MAP 	⑥ UNIT RELATIONSHIPS Simplify Calculate Compare and contrast
⑦ UNIT SELF-TEST QUESTIONS 1. How do you add, subtract, and multiply integers? 2. How do you use the distributive property to evaluate and simplify variable expressions? 3. How do you simplify a variable expression by combining like terms? 4. How can absolute value be used to evaluate expressions?		

THE SIGN OF A PRODUCT

- A product is negative if it has an odd number of negative factors.
- A product is positive if it has an even number of negative factors.

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

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

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

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

$$\underbrace{(-1)^3}_{-1} = -1$$

$$7 \cdot 7 \cdot 1 \cdot -1 = -49$$

Example 1: Multiplying Real Numbers

a. $2 \cdot 3 = \underline{6}$

Zero negative factors; + product

b. $7(\cancel{7})(\cancel{2}) = \underline{98}$
 $49 \cdot 2$

Two negative factors; + product

c. $(-2)^3(-1)^2 = \underline{-8}$
 $2 \cdot 2 \cdot 2 \cdot 1 \cdot 1$

Five negative factors; - product

d. $-3^2(-5) = \underline{45}$
 $-1 \cdot 3 \cdot 3 \cdot -5$

Two negative factors; + product

*Note: In Example 1(d), be sure you understand that -3^2 is not the same as $(-3)^2$.

$$\begin{aligned} -3^2 &= -1 \cdot 3^2 \\ &= -1 \cdot 3 \cdot 3 \\ &= \underline{-9} \end{aligned}$$

$$\begin{aligned} \underbrace{(-3)^2} &= -3 \cdot -3 \\ &= \underline{9} \end{aligned}$$

$$(-3^2) = (-1 \cdot 3 \cdot 3) = -9$$

Example 2: Products with Variable Factors

a. $x(-y) = \underline{xy}$

Two negative signs
+

b. $-a(-a) = \underline{a^2}$

Two negative signs
+

c. $-9(-a)(-b) = \underline{-9ab}$

Three negative signs

~~$9ab$~~

Neg sign, \neq , variables

Try It Complete the following exercises.

1. Find the product

$$(-1)^5 \cdot (-3)$$

$$\underbrace{(-1) \cdot (-1) \cdot (-1) \cdot (-1) \cdot (-1)}_{-1} \cdot (-3)$$

$$\underline{3}$$

2. Simplify the expression

$$6(-8t)(-t^2)$$

$$6 \cdot \underbrace{-8}_{-8} \cdot \underbrace{t}_{t} \cdot \underbrace{-1}_{-1} \cdot \underbrace{t \cdot t}_{t^2}$$

$$\underline{48t^3}$$

CONCEPT SUMMARY	PROPERTIES OF MULTIPLICATION
COMMUTATIVE PROPERTY The order in which two numbers are multiplied does not change the product.	<u>Example: $3 \cdot (-2) = (-2) \cdot 3$</u>
$a \cdot b = b \cdot a$	<u>Example: $3 \cdot (-2) = (-2) \cdot 3$</u>
ASSOCIATIVE PROPERTY The way you <u>group</u> three numbers when multiplying does not change the product.	<u>Example: $(-6 \cdot 2) \cdot 3 = -6 \cdot (2 \cdot 3)$</u>
$(a \cdot b) \cdot c = a \cdot (b \cdot c)$	<u>Example: $(-6 \cdot 2) \cdot 3 = -6 \cdot (2 \cdot 3)$</u>
IDENTITY PROPERTY The product of a number and <u>1</u> is the number.	<u>Example: $(-4) \cdot 1 = -4$</u>
$1 \cdot a = a$	<u>Example: $(-4) \cdot 1 = -4$</u>
PROPERTY OF ZERO The product of a number and <u>0</u> is 0.	<u>Example: $(-2) \cdot 0 = 0$</u>
$a \cdot 0 = 0$	<u>Example: $(-2) \cdot 0 = 0$</u>
PROPERTY OF OPPOSITES The product of a number and <u>-1</u> is the opposite of the number.	<u>Example: $(-1) \cdot (-3) = 3$</u>
$(-1) \cdot a = -a$	<u>Example: $(-1) \cdot (-3) = 3$</u>

Example 3: Evaluating a Variable Expression

Evaluate the expression when $x = -3$.

a. $2x^2$ $2(-3)^2$

$2(-3)^2$
 $2 \cdot 3 \cdot 3$

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b. $4(-x)^2$

$4(-(-3))^2$

$4(3)^2$

$4 \cdot 3 \cdot 3$

36

Summary

EQ: How can you determine if the answer of a product is going to be positive or negative?

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

↓
even
of
neg.
signs

↓
odd #
of
neg.
signs

2.5 Homework

p.96 #16-48e, 58-60, 62

Reminder:

*Crossword Due Tomorrow

*Book Cover