

9-14-18

Aim: SWBAT continue to add and subtract integers.

HW: Packet Pages 16 - 17

Quiz Thursday

Do Now: Packet page 13

IV) When **COMBINING INTEGERS** with **DIFFERENT** signs

⇒ **IGNORE** the signs and **SUBTRACT** numbers. Keep the sign of whatever you have more of  
 Subtract the absolute values. Keep the sign of the number with the largest absolute value.  
 ⇒ **SUBTRACT** and **THINK**

<p><b>A)</b> <math>12 + -8</math>  <math>12 - 8</math> (get rid of double signs)  <math>\boxed{12} \boxed{-8}</math> (box terms)  <math>= 4</math> (Different Signs → Subt. &amp; Think)                  *There are more positives, so the answer is positive*</p>	<p><b>B)</b> <math>-37 + 16</math>  <math>\boxed{-37} \boxed{+16}</math> (box terms)  <math>= -21</math> (Different Signs → Subt. &amp; Think)                  *37 has the higher absolute value, so the answer is negative*</p>
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In-Class Examples:

Same Signs ⇒ Add + Keep      Different Signs ⇒ Subtract + Think

- |                                                         |                                                                                 |                                                                              |
|---------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1) $\boxed{12} \boxed{+20}$<br>32                       | 2) $-12 \boxed{+} -20$<br>$\boxed{-12} \boxed{-20}$<br>-32                      | 3) $\boxed{-12} \boxed{+20}$<br>8                                            |
| 4) $12 \boxed{+} -20$<br>$\boxed{12} \boxed{-20}$<br>-8 | 5) $\boxed{-25} \boxed{+25}$<br>0                                               | 6) $-25 \boxed{+} -25$<br>$\boxed{-25} \boxed{-25}$<br>-50                   |
| 7) $\boxed{-10} \boxed{+5}$<br>-5                       | 8) $\boxed{-15} \boxed{+7}$<br>-8                                               | 9) $-14 \boxed{+} -15$<br>$\boxed{-14} \boxed{-15}$<br>-29                   |
| 10) $14 \boxed{+} (-8)$<br>$\boxed{14} \boxed{-8}$<br>6 | 11) $-7 \boxed{+} -18$<br>$\boxed{-7} \boxed{-18}$<br>-25                       | 12) $\boxed{-12} \boxed{+5}$<br>-7                                           |
| 13) $\boxed{-3} \boxed{+2} \boxed{+4}$<br>3             | 14) $-5 \boxed{+} -7 \boxed{+} -3$<br>$\boxed{-5} \boxed{-7} \boxed{-3}$<br>-15 | 15) $7 \boxed{+} -2 \boxed{+} -8$<br>$\boxed{7} \boxed{-2} \boxed{-8}$<br>-3 |

\*\*Absolute value bars are evaluated like parenthesis. Do whatever is inside the bars first, and then find the absolute value.

- |                                |                                     |                                 |                             |
|--------------------------------|-------------------------------------|---------------------------------|-----------------------------|
| 16) $ -4  +  5 $<br>4 + 5<br>9 | 17) $ 0 \boxed{+} -2 $<br> -2 <br>2 | 18) $ 6  +  -6 $<br>6 + 6<br>12 | 19) $ -4 + 0 $<br> -4 <br>4 |
|--------------------------------|-------------------------------------|---------------------------------|-----------------------------|

## Homework - Adding &amp; Subtracting Integers

Remember to: Get rid of Double Signs FIRST, and then Box your Terms. Next, choose your rule (Same Signs or Different Signs) and follow it.

Same signs  $\Rightarrow$  Add + Keep

Different signs  $\Rightarrow$  Subtract + Think

$$1) \boxed{-4 + 12} \begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$$

$$2) 8 + \boxed{-10} \begin{array}{r} 10 \\ -8 \\ \hline -2 \end{array}$$

$$3) -7 + \boxed{-11} \begin{array}{r} 11 \\ +7 \\ \hline -18 \end{array}$$

$$4) 25 + \boxed{-4} \begin{array}{r} 25 \\ -4 \\ \hline 21 \end{array}$$

$$5) -19 + \boxed{-3} \begin{array}{r} 19 \\ +3 \\ \hline -22 \end{array}$$

$$6) -17 + \boxed{5} \begin{array}{r} 17 \\ -5 \\ \hline -12 \end{array}$$

$$7) -25 + \boxed{-12} \begin{array}{r} 25 \\ +12 \\ \hline -37 \end{array}$$

$$8) \boxed{-31 + 31} \begin{array}{r} 31 \\ -31 \\ \hline 0 \end{array}$$

$$9) 5 + \boxed{-21} \begin{array}{r} 21 \\ -5 \\ \hline -16 \end{array}$$

$$10) -3 + \boxed{-17} \begin{array}{r} 17 \\ +3 \\ \hline -20 \end{array}$$

$$11) -20 + \boxed{2} \begin{array}{r} 20 \\ -2 \\ \hline -18 \end{array}$$

$$12) 0 + \boxed{-15} \begin{array}{r} 15 \\ -0 \\ \hline -15 \end{array}$$

$$13) -8 + 9 + \boxed{-2} \begin{array}{r} -8 + 9 - 2 \\ \hline -1 \end{array}$$

$$14) -3 + 12 + \boxed{-4} \begin{array}{r} -3 + 12 - 4 \\ \hline 5 \end{array}$$

$$15) 16 + -9 + -7 \begin{array}{r} 16 - 9 - 7 \\ \hline 0 \end{array}$$

Complete the statement using always, sometimes, or never.

Always = Always True, Sometimes = Sometimes True, Never = Never True

Look at the examples above to help you!!!

16) The sum of two positive integers is NEVER zero.

17) The sum of zero and a positive integer is NEVER zero.

18) The sum of zero and a negative integer is NEVER zero.

19) The sum of a positive integer and a negative integer is SOMETIMES zero.

AIM: SWBAT continue to add and subtract integers.

"Do Now - Properties of Addition & Multiplication"

State the name of the property that is shown.

- |                                    |                          |
|------------------------------------|--------------------------|
| 1) $(2 + 7) + 10 = 2 + (7 + 10)$   | <u>Associative, +</u>    |
| 2) $7x + 7y = 7(x + y)$            | <u>Distributive</u>      |
| 3) $5x \cdot 1 = 5x$               | <u>Identity, \cdot</u>   |
| * 4) $(5 + 8) + 12 = (8 + 5) + 12$ | <u>Commutative, +</u>    |
| 5) $700 + 0 = 700$                 | <u>Identity, +</u>       |
| 6) $5(2x + 3) = 10x + 15$          | <u>Distributive</u>      |
| 7) $(75 + 4) + 0 = (75 + 4)$       | <u>Identity, +</u>       |
| 8) $8y \cdot 0 = 0$                | <u>Multiplicative, 0</u> |

Notes.

**Additive Inverse Property** - For every number,  $a$ ,  $a + -a = 0$

Additive inverse  $\Rightarrow$  Opposite

State the additive inverse of each of the following.

- 1)  $-2$  2    2)  $14$  -14    3)  $-4x$  4x    4)  $-18mn$  18mn    5)  $-24$  24

### ADDING & SUBTRACTING INTEGERS

I) Get rid of DOUBLE SIGNS first!

- + - becomes a NEGATIVE
- - - becomes a POSITIVE

II) BOX YOUR TERMS!

\*\* The sign IN FRONT of the number goes with the number \*\*

III) Choose and follow your rule:

- When **COMBINING INTEGERS** with the **SAME** signs  
 $\Rightarrow$  **ADD** and **KEEP**
- When **COMBINING INTEGERS** with **DIFFERENT** signs  
 $\Rightarrow$  **SUBTRACT** and **THINK**

More Examples for Reference:

Ex:  $7 - 4$

7	-4
---	----

(Diff signs → Subt/Think)

3

$-7 - 4$

-7	-4
----	----

(Same signs → Add/Keep)

-11

**BEWARE OF DOUBLE NEGATIVES!!!!** Remember (-) means opposite so  $-(-4) = +4$

**DOUBLE NEGATIVES → ADD**

Example:  $8 - -4$

8	--4
---	-----

$8 + 4$

12

**DOUBLE (Diff) SIGNS → SUBTRACT**

Example:  $8 + -4$

8	+-4
---	-----

$8 - 4$

4

In Class Examples: Compute: Beware of Double Signs!

Same signs ⇒ Add and Keep

Different signs ⇒ Subtract + Think

1)  $7 + -13$

7	-13
---	-----

$\frac{-13}{-6}$

2)  $-8 - 5$

-8	-5
----	----

$\frac{8}{+5}$

-13

3)  $-17 - 9$

-17	-9
-----	----

$\frac{17}{+9}$

-26

4)  $9 + -2$

9	+2
---	----

$\frac{9}{+2}$

11

5)  $27 + -19$

27	-19
----	-----

$\frac{27}{-19}$

8

6)  $5 - 8$

5	-8
---	----

$\frac{8}{-5}$

-3

7)  $0 + 14$

0	+14
---	-----

$\frac{14}{+0}$

14

8)  $-21 - (-14)$

-21	+14
-----	-----

$\frac{-21}{-14}$

-7

**Variable** - a letter or symbol that represents a number.

Ex: n, y, x

**Coefficient** - a number in front of a variable

Ex:  $4n \rightarrow 4$  is the coefficient and  $n$  is the variable

$-5x \rightarrow -5$  is the coefficient and  $x$  is the variable

\*\*\*When there is not a number in front of a variable, the coefficient is 1.

Ex:  $n \rightarrow 1$  is the coefficient and  $n$  is the variable

\*\*\*When there is only a negative sign in front of a variable, the coefficient is -1.

Ex:  $-n \rightarrow -1$  is the coefficient and  $n$  is the variable

**Term** - a part of an expression that is separated by a "plus" or "minus" sign.

Ex:  $3x + 4y \rightarrow 3x$  is a term &  $4y$  is a term

**Constant Term** - a term that has a number but no variable.

Ex: 5, 7, 100, 2,000

**Like Terms** - terms with the EXACT same variables and EXACT same exponents

Ex:  $5y$  and  $6y$  are like terms

$5x^2$  and  $6x^2$  are like terms

$10$  and  $-2$  (constants are like terms with each other)

Non-examples:  $5x$  and  $3y$

$2x$  and  $3$

$-4x$  and  $3x^2$

9)  $\boxed{-5x - 3x} = -8x$       $\frac{+5}{3} = \frac{5}{3}$

10)  $-6a - (-8a) = \boxed{-6a + 8a} = 2a$       $\frac{-8}{2} = -\frac{8}{2}$

11)  $\boxed{7y - 13y} = -6y$       $\frac{-13}{6} = -\frac{13}{6}$

12)  $-13z - (-18z) = \boxed{-13z + 18z} = 5z$       $\frac{+18}{5} = \frac{18}{5}$

13)  $-18x - (-18x) = -18x + 18x = 0$       $\frac{-18}{-18} = 1$

14)  $-70x + (-18x) = \boxed{-70x - 18x} = -88x$       $\frac{+18}{-18} = -1$

15)  $-573y - (-600y) = \boxed{-573y + 600y} = 27y$       $\frac{-600}{-573} = \frac{600}{573}$

16)  $9x - 6x - 12x = \boxed{9x + 6x - 12x} = 3x$       $\frac{+6}{-12} = -\frac{1}{2}$

## Class Work (Finish for Homework)

- 1) What is the additive inverse of 19? \_\_\_\_\_
- 2) What is the opposite of -24? \_\_\_\_\_
- 3) How many numbers have an absolute value of 12? \_\_\_\_\_ List them. \_\_\_\_\_
- 4) The counting numbers are \_\_\_\_\_.
- 5) The whole numbers are ALL the \_\_\_\_\_ and \_\_\_\_\_.
- 6) The integers are ALL the \_\_\_\_\_ and their \_\_\_\_\_.

For 7-12 state whether each of the following is TRUE or FALSE.

- 7) One-half is **not** an integer. \_\_\_\_\_
- 8) If  $x$  is a positive integer, then  $x > 0$  \_\_\_\_\_
- 9) If  $x$  is a negative integer, then  $x < 0$  \_\_\_\_\_
- 10) A whole number is an integer. \_\_\_\_\_
- 11) An integer is a whole number. \_\_\_\_\_
- 12) Zero is a positive integer. \_\_\_\_\_

Simplify each expression.

REMEMBER - BOX OFF YOUR TERMS AND FOLLOW THE RULES.

BEWARE OF DOUBLE NEGATIVES!

Same signs  $\Rightarrow$  \_\_\_\_\_

Different signs  $\Rightarrow$  \_\_\_\_\_

13)  $-21 + 7$

14)  $-29 + -15$

15)  $-20 + 8 + 22 + -10$

16)  $5 + (-7)$

17)  $65 - 72$

18)  $-85 - -42$

19)  $-32 - 74$

20)  $15 - 21$

21)  $-39 + 25 + 65$

22)  $-38 + -19 + -3$

23)  $24 - -19 + 12$

24)  $-11 + 10 - 7 + 9$

25)  $5x + -21x$

26)  $-3x + -17x$

27)  $-3x + 12x - 14x$

28)  $-18y - 37y$

29)  $11y - -27y$

30)  $-2y - 3y + 6x - 9x$

$-3x - 5y$

$$\begin{array}{r} 52 \\ -13 \\ \hline \end{array}$$

31)  $-52a + 17b + 13a - 5b$

$-39a + 22b$

32)  $47x + -15x + 6x - 10x$

33)  $-50x - 10x - 18y + 100y$