

9-13-18

Aim: SWBAT add and subtract integers.

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## HOMEWORK - Properties &amp; Introduction to Adding Integers

State the name of the property that is shown.

- |  |                               |
|--|-------------------------------|
| 1) $(x + 9) + 1 = x + (9 + 1)$                     | 1) <u>Associative, +</u>      |
| 2) $1 \cdot x = x$                                 | 2) <u>Identity, \cdot</u>     |
| 3) $(2 + 3) + 5 = 2 + (3 + 5)$                     | 3) <u>Associative, +</u>      |
| * 4) $(12 + 9) + 15 = (9 + 12) + 15$               | 4) <u>Commutative, +</u>      |
| 5) $(2 + 7) \cdot 0 = 0$                           | 5) <u>Multiplicative, 0</u>   |
| 6) $12 \cdot (7 \cdot 15) = (12 \cdot 7) \cdot 15$ | 6) <u>Associative, \cdot</u>  |
| 7) $0 + (9 + 1) = 9 + 1$                           | 7) <u>Identity, +</u>         |
| 8) $3(4x + 9) = 12x + 27$                          | 8) <u>Distributive</u>        |
| 9) $r \cdot 1 = r$                                 | 9) <u>Identity, \cdot</u>     |
| 10) $(8 \cdot 6) \cdot 9 = 8 \cdot (6 \cdot 9)$    | 10) <u>Associative, \cdot</u> |
| 11) $106 \cdot 0 = 0$                              | 11) <u>Multiplicative, 0</u>  |
| 12) $4(a + b) = 4a + 4b$                           | 12) <u>Distributive</u>       |
| 13) $-y + y = 0$                                   | 13) <u>Inverse, +</u>         |
| * 14) $(2 + y) + 8 = 8 + (2 + y)$                  | 14) <u>Commutative, +</u>     |
| 15) $c \cdot \frac{1}{c} = 1$                      | 15) <u>Inverse, \cdot</u>     |
| * 16) $(8 \cdot 6) + 9 = (6 \cdot 8) + 9$          | 16) <u>Commutative, \cdot</u> |

17)  $\boxed{-11} + 32 = 21$     18)  $8 + \overline{8} = 0$     19)  $\boxed{-78} - 15 = -93$     20)  $\boxed{-25} + 20 = -5$   
 $\boxed{8} - 8$

AIM: **SWBAT** add and subtract integers.

"Do Now"

1) What is the IDENTITY ELEMENT for Addition? 0 For Multiplication? 1

\* 2) What is the additive inverse of  $\frac{1}{4}$ ?  $-\frac{1}{4}$  Multiplicative inverse?  $\frac{4}{1} \rightarrow 4$   
*opposite* *reciprocal*

Simplify the following:

3)  $\boxed{-8} + \boxed{2} = -6$

4)  $\boxed{-2} + \boxed{4} = 2$

5)  $\boxed{5} - \boxed{10} = -5$

6)  $\boxed{-3} + \boxed{9} = 6$

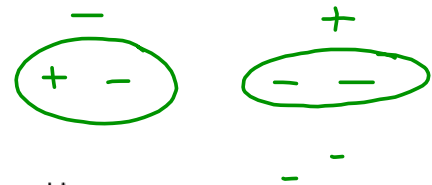
7)  $\boxed{2} - \boxed{7} = -5$

8)  $\boxed{-10} + \boxed{12} = 2$

**ADDING & SUBTRACTING INTEGERS**

I) Get rid of DOUBLE SIGNS first!

- + - becomes a NEGATIVE (so  $7 + -3$  becomes  $7 - 3$ )
- - - becomes a POSITIVE (so  $6 - -3$  becomes  $6 + 3$ )



II) BOX YOUR TERMS!

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

III) When **COMBINING INTEGERS** with the **SAME** signs

- ⇒ ADD the numbers and KEEP the same sign.
- ⇒ ADD and KEEP

Examples:

<p>A) <math>\boxed{12} + \boxed{4}</math>  <math>\rightarrow 16</math>                  *Basic Addition - adding two positive numbers*</p>	<p>B) <math>-\boxed{12} - \boxed{4}</math>  <math>-12 - 4</math> (get rid of double signs)  <math>\boxed{-12} - \boxed{4}</math> (box terms)  <math>\rightarrow -16</math> (Same Signs <math>\rightarrow</math> Add &amp; Keep)</p>
<p>C) <math>25 - (-16)</math>  <math>\boxed{25} + \boxed{16}</math> (get rid of double signs)  <math>\rightarrow 41</math>                  *Basic Addition - adding two positive numbers*</p>	<p>D) <math>-\boxed{25} - \boxed{16}</math>  <math>-25 - 16</math> (get rid of double signs)  <math>\boxed{-25} - \boxed{16}</math> (box terms)  <math>\rightarrow -41</math> (Same Signs <math>\rightarrow</math> Add &amp; Keep)</p>

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>A) <math>12 + (-8)</math>  <math>12 - 8</math> (get rid of double signs)  <math>\boxed{12} \boxed{-8}</math> (box terms)  <math>\rightarrow 4</math> (Different Signs → Subt. &amp; Think)  <del>*</del> *There are more positives, so the answer is positive*</p>	<p>B) <math>-37 + 16</math>  <math>\boxed{-37} \boxed{+16}</math> (box terms)  <math>\rightarrow -21</math> (Different Signs → Subt. &amp; Think)  <del>*</del> *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) $\boxed{12} \boxed{+20}$ all positives 32 $\begin{array}{r} 12 \\ +20 \\ \hline 32 \end{array}$	2) $-12 + (-20)$ all negatives -32 $\begin{array}{r} -12 \\ -20 \\ \hline -32 \end{array}$	3) $\boxed{-12} \boxed{+20}$ more positives 8 $\begin{array}{r} 20 \\ -12 \\ \hline 8 \end{array}$
4) $12 + (-20)$ more negatives -8 $\begin{array}{r} 12 \\ -20 \\ \hline -8 \end{array}$	5) $\boxed{-25} \boxed{+25}$ 0 $\begin{array}{r} -25 \\ +25 \\ \hline 0 \end{array}$	6) $-25 + (-25)$ all negatives -50 $\begin{array}{r} -25 \\ -25 \\ \hline -50 \end{array}$
7) $\boxed{-10} \boxed{+5}$ more negatives -5 $\begin{array}{r} -10 \\ +5 \\ \hline -5 \end{array}$	8) $\boxed{-15} \boxed{+7}$ -8 $\begin{array}{r} -15 \\ +7 \\ \hline -8 \end{array}$	9) $-14 + (-15)$ more negatives -29 $\begin{array}{r} -14 \\ -15 \\ \hline -29 \end{array}$
10) $14 + (-8)$ 6 $\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$	11) $-7 + (-18)$ -25 $\begin{array}{r} -7 \\ -18 \\ \hline -25 \end{array}$	12) $\boxed{-12} \boxed{+5}$ -7 $\begin{array}{r} -12 \\ +5 \\ \hline -7 \end{array}$
13) $\boxed{-3} \boxed{+2} \boxed{+4}$	14) $-5 + (-7) + (-3)$ -15 $\begin{array}{r} -5 \\ -7 \\ -3 \\ \hline -15 \end{array}$	15) $7 + (-2) + (-8)$ -3 $\begin{array}{r} 7 \\ -2 \\ -8 \\ \hline -3 \end{array}$

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

- 16)  $|-4| + |5|$       17)  $|0 + -2|$       18)  $|6| + |-6|$       19)  $|-4 + 0|$

**Homework - Adding & 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  $\Rightarrow$  \_\_\_\_\_Different signs  $\Rightarrow$  \_\_\_\_\_

1)  $-4 + 12$

2)  $8 + -10$

3)  $-7 + -11$

4)  $25 + -4$

5)  $-19 + -3$

6)  $-17 - (-5)$

7)  $-25 + -12$

8)  $-31 + 31$

9)  $5 + (-21)$

10)  $-3 + -17$

11)  $-20 - (-2)$

12)  $0 + -15$

13)  $-8 + 9 + -2$

14)  $-3 + 12 + -4$

15)  $16 + -9 + -7$

**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 \_\_\_\_\_ zero.

17) The sum of zero and a positive integer is \_\_\_\_\_ zero.

18) The sum of zero and a negative integer is \_\_\_\_\_ zero.

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