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| ***Integers***  **Handout** | **Name: Date:** |

**Objective: Learn how to add, subtract, multiply and divide integers**

**Segment 1**: **Definition of an Integer**

The set of integers is made up of the following numbers:



Notice the set of integers includes the natural numbers 1,2,3,4,… , zero, and the negative numbers -1, -2, -3, …

**Segment 2: Definition of absolute value**

The absolute value of a real number is the distance from zero.   
The absolute value of a number *x* is denoted ****

(Notice that the absolute value of a number is always positive

since distance cannot be negative.)

**Example 1  14**

**Example 2**  27

**Segment 3: Adding integers with the same sign.**

To add integers with the same sign (both positive or both negative),

add the absolute value of the numbers together and keep the sign the same.

(When you add two integers with the same sign, think “add the

numbers and keep the sign”)

**Example 3  -14**

**Example 4**  20

**Example 5**  -34

**Note: A good example of integers is seen in the use of money. Think of positive numbers as finding or earning money while negative numbers as losing money. So in Example 3, we can think of the problem as losing $4 and then losing $10. What is your net gain or loss? The person has lost a total of $14 (-14).**

**Segment 4: Adding integers with opposite signs.**

To add integers with the opposite signs (one positive and one negative),  
subtract the absolute value of the numbers and keep the sign   
of the number with the larger absolute value.

(When you add two integers with opposite signs, think

“subtract the numbers and keep the sign of the larger”)

**Example 6  -6**

**Example 7**  6

**Example 8**  -24

**Note: Use the example of money again. Notice in Example 7, we can think of the problem as earning $17 and then losing $11. What is your net gain or loss? The person has a net gain of $6 (+6).**

Now it is time for you to practice. Break up into pairs and work on the following problems using the rules discussed above.

**Practice 1  19 Practice 2  23**

**Practice 3**  7 **Practice 4**  -21

**Practice 5**  -180 **Practice 6**  -18

**Practice 7**  -60

Now explain. Pick one problem above and explain to your partner how you got the answer.

**Segment 5: Definition of an opposite**

Two numbers are considered ***opposites*** if they have the same absolute value

(same distance from zero) but lie on opposite sides of zero on the number line.

(For example -8 and +8 are considered opposites of each other.

**Example 9 What is the opposite of +16? -16**

**Example 10 What is the opposite of ? +7**

**Segment 6: Subtracting integers by adding the opposite.**

To subtract an integer from another, add the opposite value of   
the integer you are subtracting. You can use the following formula:



(For example, subtracting 12 is the same as adding  and

subtracting is the same as adding 5.

numbers and keep the sign”)

**Example 11  -10**

**Example 12**  -7

**Example 13**  3

Now it is time for you to practice. Break up into pairs and work on the following problems using the rules discussed above.

**Practice 8** What is the opposite of ? **14 Practice 9** What is the opposite of ? **-21**

**Practice 10**  25 **Practice 11**  -33

**Practice 12**  -64 **Practice 13**  -18

Now explain. Pick one problem above and explain to your partner how you got the answer.

**Segment 7: Multiplying and Dividing integers with the same sign.**

To multiply or divide integers with the same sign (both positive or both negative),

multiply or divide the absolute value of the numbers. **The answer will be positive.**

(Note: When multiplying negative integers, you will often see   
two parenthesis next to each other.)

**Example 14  42**

**Example 15**  168

**Example 16**  2,135

**Segment 8: Multiplying and Dividing integers with opposite signs.**

To multiply or divide integers with opposite signs (one positive and one negative),

multiply or divide the absolute value of the numbers. **The answer will be negative.**

(Note: When multiplying negative integers, you will often see   
two parenthesis next to each other.)

**Example 17  -80**

**Example 18**  -92

**Example 19**  -840

Now it is time for you to practice. Break up into pairs and work on the following problems using the rules discussed above.

**Practice 14**  = **56 Practice 15** = **-126**

**Practice 16**  -96 **Practice 17**  2,000

**Practice 18**  -810

Now explain. Pick one problem above and explain to your partner how you got the answer.

**Segment 9: Order of operations problems with integers**

When simplifying a problem with multiple operations, be sure to follow the following order.

**Order of Operations**

1. **Parenthesis**
2. **Exponents**
3. **Multiplication and Division in order from left to right**
4. **Addition and Subtraction in order from left to right**

**Example 20  -55**

Now it is time for you to practice. Break up into pairs and work on the following problems using the rules discussed above.

**Practice 14**   **9 Practice 15  3**

Now explain. Pick one problem above and explain to your partner how you got the answer.

**Quiz:** Let’s check to see how much you have learned. Take the quiz. Then check your answers.

When you are done, fill out the following self reflection.

**SELF-REFLECTION**

-Which segment of the exponential expressions was most challenging for you?

-What steps are you going to take to learn this subject?