Objective: To read & write integers
To graph integers on a number line

Date: _____

Introduction to Integers

The Examples:

What does an integer look like?

{….-3, -2, -1, 0, 1, 2, 3…}

Zero is not positive or negative.

Write an Integer for each Situation:

1) *falling 6 feet*
   A: -6 ft
2) *a profit of $12*
   A: +$12 or $12
3) *22° F below 0*
   A: -22° F

Explanation:

An integer is any positive or negative whole number

Which integers are less than zero?

- Negative Integers

Which integers greater than zero?

- Positive Integers

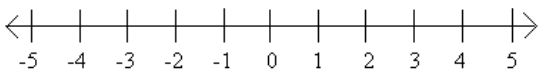
**Don't forget labels!!

Fact: The + sign is optional. If you do not see the + sign in front of a number, it is understood to be positive.

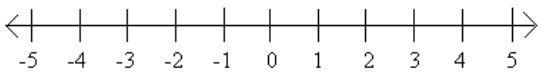
Graphing Integers

The Examples:

4) Graph the set of integers {-1, 3, -2}

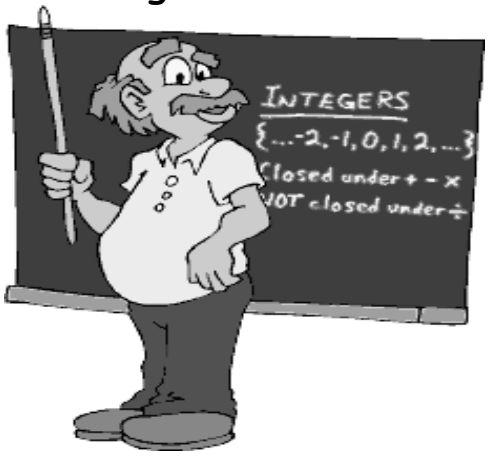


5) Graph the set of integers {-2, 1, -4, 0}



Explanation:

To graph an integer, you will need a number line. Draw a point at the location of each integer.



Objective: To find the absolute value of a number
To evaluate expressions

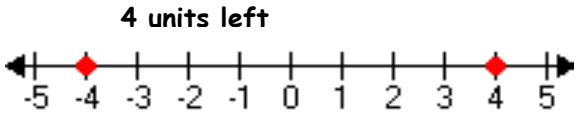
Date: _____

Absolute Value

The Examples:

1) Evaluate the expression | -4 |

On the number line, the graph of -4 is 4 units from 0.



So, | -4 | = 4

2) | 11 | = 11

Explanation:

Absolute value of a number is its distance from zero on the number line.

Two vertical bars are used to represent absolute value.

The symbol for the absolute value of -4 is | -4 |

The numbers 4 and -4 are the same distance from 0. So, 4 and -4 have the same absolute value

3) Evaluate the Expression:

| -4 | - | 3 | = 4 - 3
= 1

Remember | - 4 | = 4, | 3 | = 3
Subtract.

4) $9 + | -6 | \div 1^2$

$9 + 6 \div 1^2$

$9 + 6 \div 1$

$9 + 6$

15

***Rewrite the problem without absolute value**
*Follow PEMDAS!!! First do exponents
*Then divide
*Finally add

Objective: To compare Integers Date: _____

Comparing Integers

The Examples:

Replace each ⬭ with < or > to make a true sentence.

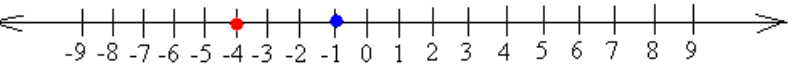
1. $5 < $8

2. -$2 < $10

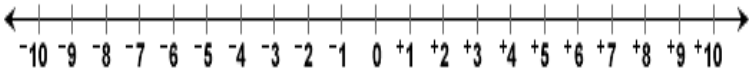
3. $3 = +$3

Trick Question!!!

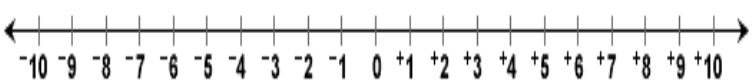
1. -1 > -4



2. -2 > -5



3. | -4 | > 3



Explanation:

This symbol < means less than.
This symbol > means greater than.
The alligator eats the bigger number!

**Don't forget that the + sign is optional. If you do not see the + sign in front of a number, it is understood to be positive.

When two numbers are graphed on a number line, the number to the left is always less than the number to the right. Thus, the number to the right is always greater than the number to the left.

Hint: It helps to first graph the numbers!

**Don't forget that absolute value is *always positive.* So, | -4 | = 4

Objective: To Order Integers Date: _____

Ordering Integers

The Examples:

Order the integers from least to greatest:

4. 12, -6, 20, -47, -11
   A: -47, -11, -6, 12, 20

5. | -13 |, 0, 7, -8, -5, | 2 |
   A: -8, -5, 0, 2, 7, 13

Explanation:

Remember: Order integers on the number line from left to right for least to greatest.

Remember: | -13 | = 13 and | 2 | = 2

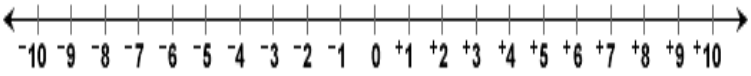
Determine whether each sentence is *True* or *False*. If ***False***, change ONE number to make the sentence true.

6. -7 < 3
   A: True

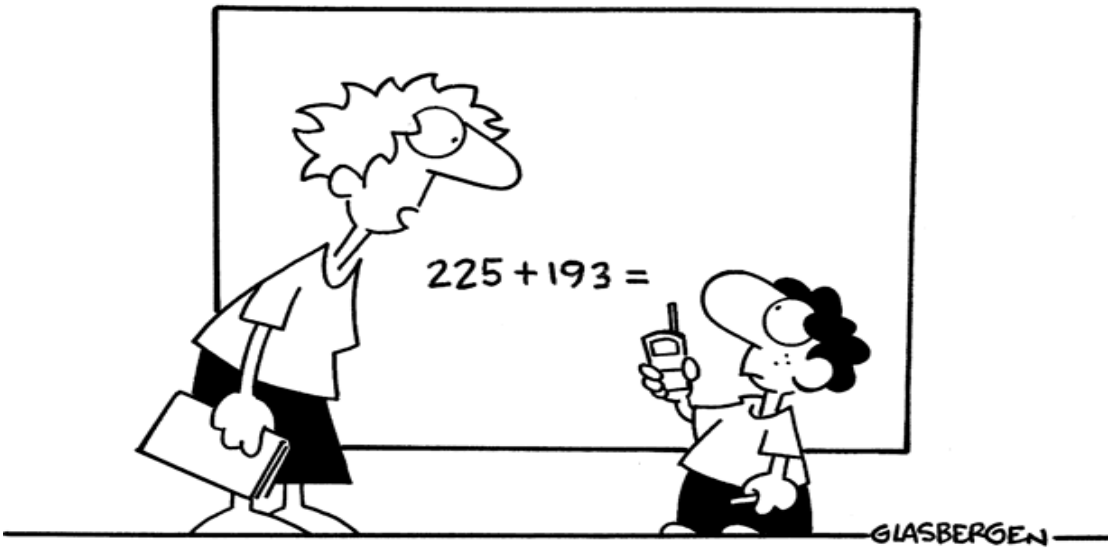
7. -20 < -22
   A: False; -20 < +22

8. 3 > | -5 |
   A: False; 3 > | -2 |

Think: Which is bigger -7 than 3? 3



Think: The | -5 | is 5
So is 3 or | -5 | bigger? 5



"You have to solve this problem by yourself. You can't call tech support."

Objective: To Add Integers Date: _____

Adding Integers

The Examples:

1) 5 + 3 = 8
2) -5 + -3 = -8
3) 5 + -3 = 2
4) -5 + 3 = -2

Explanation:

What pattern do you notice?

*Same signs, add the numbers and keep the sign of the number

*Different signs, subtract the numbers and take the sign of the farther number

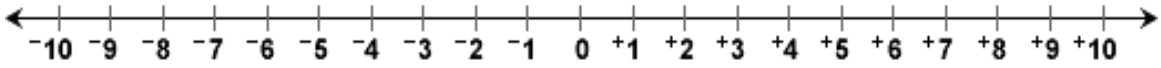
Sounds like a song to me!

(Verse 1)

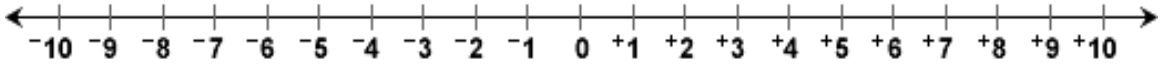
Same Sign Add and Keep
Different Sign Subtract
Take the sign of the farther number
Then It'll be Exact

Let's try some more: Hint: Use a number line to help in the beginning!

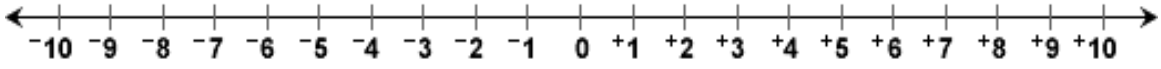
5) 2 + 3 = **5**



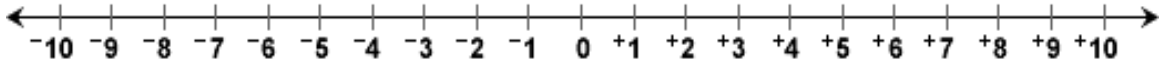
6) -3 + (-8) = **-11**



7) -7 + 13 = **4**



6 + (-7) = **-1**



Objective: To Subtract Integers Date: _____

Subtracting Integers

As easy as adding integers!

Sing the song and you will know too!!

(Verse 2)

Change the Minus to a Plus
Change the Sign of Next
Then All You Do is Add them Up
As if it were a Plus!

Let's try some examples:

1) 5 – 2 = **3**

2) -3 – 2 = **-5**

3) 15 – (-7) = **22**

4) -18 – (-40) = **22**

Explanation:

Hint: Use a chart!!

Same	Change	Change
5	+	-2

Same	Change	Change
-3	+	-2

Same	Change	Change
15	+	7

Same	Change	Change
-18	+	40

Evaluate each expression if r = -4, s = 10, and t = -7

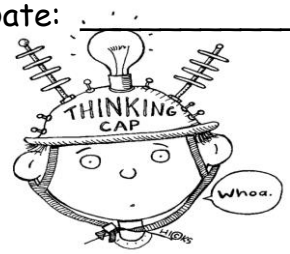
5) r – 7 = **-11**

6) t – s = **-17**

	Same	Change	Change
5)	-4	+	-7
6)	-7	+	-10

Objective: To add & subtract Chains of Integers Date: _____

Chains of Integers



The Examples:

Compute:

$12 + (+5) + 5 + (-17) + -6 + 5$

$--23 + 27$

↑ The sum of the negatives ↑ The sum of the positives

4

↑ Final Answer

Explanation:

1. Remember, we like to ADD!

So, what do we do with the subtraction signs? (Hint: Think of the song)

Change the minus to a plus

Change the sign of next

2. Now that there are "+" signs between *ALL* numbers, we need to circle and add the negatives
3. Add the positive numbers.
4. Add the two sums for a final answer!

Let's try some more ☺

$-6 + 7 + 6 + (-7) + (+5) + -13$

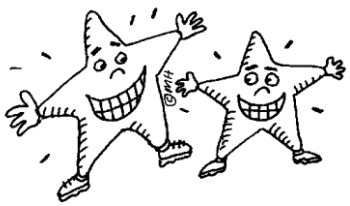
$-26 + 18$

-8

$5 + (+17) + -5 + (-17) + 8 + 9$

$-22 + 39$

17



Adding Rules

Same sign add and keep

Different sign subtract

Take the sign of the farther number

Then It'll be exact!

Subtracting Rules

Change the minus to a plus

Change the sign of next

Then all you do is add them up

As if it were a plus! (Ole)

Objective: To multiply Integers Date: _____

Multiplying Integers

The Examples:

2 x 5 = 10
-2 x -5 = 10
2 x -5 = -10
-2 x 5 = -10
-2 x 5 x -1 = 10
-2 x -5 x -1 = -10

Explanation:

REMEMBER: There are three different ways to represent multiplication of two numbers. 2 x 3; 2 • 3; 2(3)

Rule:
Count the negatives.
* Even number of negatives = + answer
* Odd number of negatives = - answer

Multiply:

1. -4(6) = -24
2. -2(-8) = 16
3. -2(-5)(-3) = -30
4. $-(5)^2 = -(5 \times 5) = -25$

May need to explain how the exponents work with negative numbers.

Evaluate each expression if g = -5, h = -3, and k = 4

5. 7gk
   7(-5)(4)
   -35(4)
   -140

6. $-2h^2$
   $-2(-3)^2$
   -2(9)
   -18

Objective: To Divide Integers Date: _____

Dividing Integers

The Examples:

The rule is the same as multiplying integers. Let's review. →

Explanation:

REMEMBER: There are three different ways to represent division of two numbers. $6 \div 3$, $\frac{6}{3}$, $3\overline{)6}$

Rule:

Count the negatives.

* Even number of negatives = + answer
* Odd number of negatives = - answer

Divide:

1. $-15 \div 3$ -5
2. $-49 \div (-7)$ 7
3. $\frac{36}{-4}$ -9
4. $\frac{0}{-9}$ 0

Evaluate each expression if m = -32, n = 2, and p = -8

5. $\frac{-p}{n}$ $\frac{-(-8)}{2}$ $\frac{8}{2}$ 4

6. $p \div n^2$

   $-8 \div 2^2$

   $-8 \div 4$

   -2

7. $\frac{18-n}{p}$ $\frac{18-2}{-8}$ $\frac{16}{-8}$ -2

10/3/11 Order of Operations w/ Integers

ex 1: $(4+6) \div 2 + 8 \times 3 - 5$

$10 \div 2 + 8 \times 3 - 5$

$5 + 24 - 5$

24

ex 2: $-3 - (5+8)(7+14+11)$

$-3 - -3(-7+11)$

$-3 - -3(4)$

$-3 + +12$

9

ex 3: $[(10)(30) \div 15 \times 4] \div 10 + 10$

$[300 \div 15 \times 4] \div 10 + 10$

$[20 \times 4] \div 10 + 10$

$80 \div 10 + 10$

$8 + 10$

18

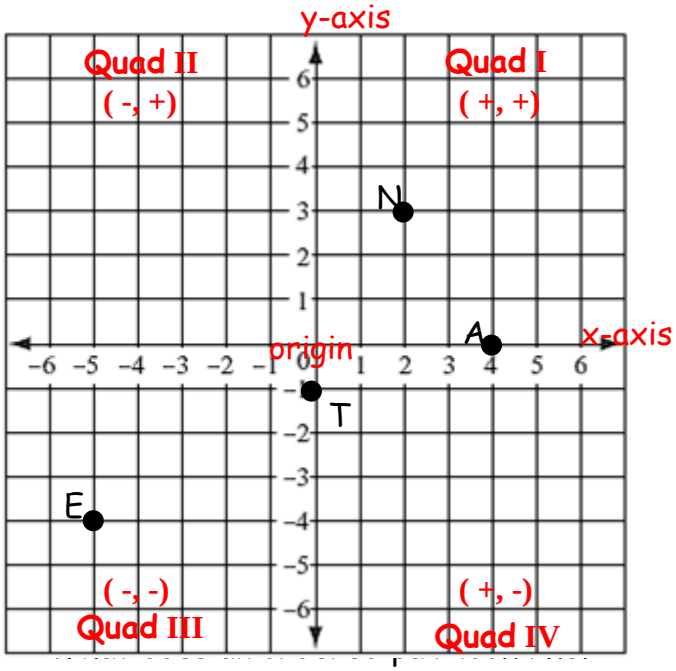
Objective: To graph points on a coordinate plane. Date: _____

The Coordinate Plane

The Examples:

What does the coordinate plane look like?

The Coordinate Plane



- (___ , ___)
- _____
- _____

answers will vary

Name the ordered pair for the points on the graph above. Then identify the quadrant in which the point lies.

1) N (2, 3) Quad I
2) E (-5, -4) Quad III
3) A (4, 0) x-axis
4) T (-1, 0) y-axis

Explanation:

A coordinate plane is a plane in which a horizontal number line and a vertical number line intersect at their zero points.

- The x-axis is the horizontal number line.
- The y-axis is the vertical number line.

There are four quadrants on a coordinate plane represented by Roman numerals (I, II, III, and IV) that are positioned counterclockwise starting at the top right.

An ordered pair is a pair of numbers, separated by a comma, used to locate a point on the coordinate plane. The first number is the x-coordinate. The second number is the y-coordinate. (x, y)

The origin is the point at which the x-axis and y-axis intersect in the coordinate plane.

Now, have the students go back to first graph and label the Quads (+, +) etc.

The Coordinate Plane (cont…)

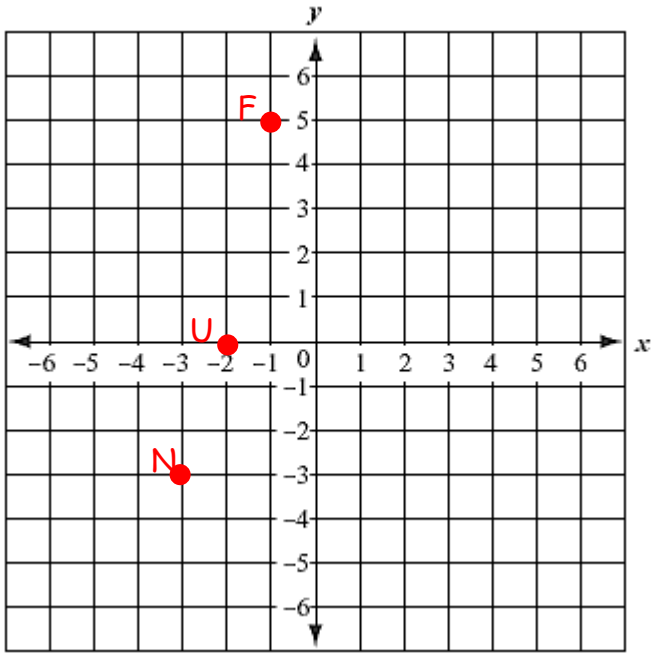
The Examples:

Graph and label each point on the coordinate plane below:

5) F (-1,5)

6) N (-3, -3)

7) U (-2, 0)



Now, have the students go back to first graph and label the Quads (+, +) etc, label quads, label axes, and order