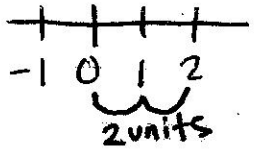
EQ: How can you use integers to represent distance?

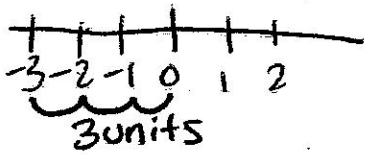
1.1 Absolute Value

Absolute value: the distance between a number and zero on the number line.

EX: $|2| = 2$

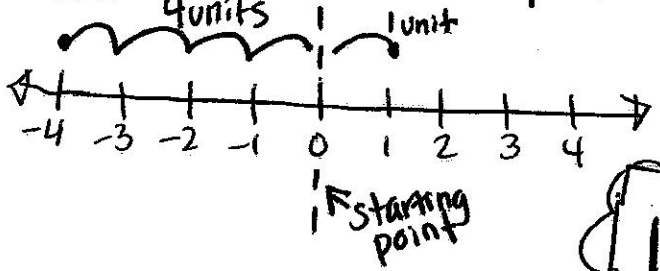


$|-3| = 3$



* absolute value is positive because it is a distance! (Distance is always positive!)

Compare: 1 and $|-4|$



$1 < |-4|$

$1 < 4$

Order: $|-5|, 2, |-1|, |0|, |-3|$

$5, 2, 1, 0, 3$

Summary:

1.2 Adding Integers

EQ: Is the sum of two integers positive, negative, or zero?

Integers: positive or negative numbers

sum → add

2 cases:

Same Sign: $5 + 2 = 7$

or

$-5 + (-2) = -7$

* If both numbers have the same sign, you add the numbers and keep the same sign.

Different Signs: $5 + (-2) = 3$

or

$-5 + 2 = -3$

* If the numbers have different signs, you ~~subtract~~ subtract and take the sign of the "greater number" (greater absolute value)

Summary:

1.3 Subtracting Integers

EQ: How are adding and subtracting integers related?

Steps:
1. Keep the first number
2. Change the subtraction sign to addition
3. Take the opposite (change the sign) of the 2nd number

Subtracting integers: are just adding the opposite

"BOOM BOOM!"

Example 1: $10 + (+3)$
(change to addition; take the opposite)
$10 + 3 = 13$

"BOOM BOOM!!"

Example 2: $-5 + -15$
(keep! change to +; take the opposite)
$-5 + -15 = -20$

"BOOM BOOM"

Example 3: $-8 + (+2)$
(keep! change; take the opposite)
$-8 + 2 = -6$

On your own!

1) $7 - (-4)$
$7 + 4 = 11$

2) $-8 - 10$
$-8 + (-10) = -18$

3) $-5 - (-9)$
$-5 + 9 = 4$

4) $-3 - 4 - (-2)$
$-3 + 4$
$-7 - (-2)$
$-7 + 2 = -5$

Summary:

1.4 Multiplying Integers

* 3 cases *

EQ: Is the product of two integers positive, negative, or zero?

Case 1: both integers are positive

Example: $8 \cdot 2 = 16$ (positive · positive = positive)

* positive x positive = positive

Case 2: Integers have different signs. One is positive and the other is negative

Example: $-8 \cdot 2 = -16$ (neg · pos = neg)

or

$8 \cdot (-2) = -16$ (positive · negative = negative)

* If integers have different signs their product is negative.

* negative x positive = negative

Case 3: both integers are negative

Example: $-8 \cdot (-2) = 16$ (negative · negative = positive)

* negative x negative = positive

Summary:

1.5 Dividing Integers

EQ: Is the quotient of two integers positive, negative, or zero?

* 5 cases *

Case 1: both integers are positive

Example: $15 \div 5 = 3$

* positive ÷ positive = positive

Case 2: Integers have different signs.

Example: $\frac{-15}{5} = -3$ $\frac{15}{-5} = -3$

* positive ÷ negative = negative

(pos ÷ neg = neg.)

Case 3: both integers are negative

Example: $\frac{-15}{-5} = 3$ $-15 \div (-5) = 3$

* negative ÷ negative = positive

Same as multiplication

Case 4

$15 \div 0 =$ ——

or $\frac{15}{0}$ = *undefined or N/A

zero on bottom

Case 5

$0 \div 15 =$

or $\frac{0}{15} = 0$ zero on top

Find the mean of the numbers

2, −10, 8, 22

$2 + (-10) + 8 + 22 = \frac{22}{4}$

* add the numbers

* divide by how many #s there are

$= 5.5$

Summary: