

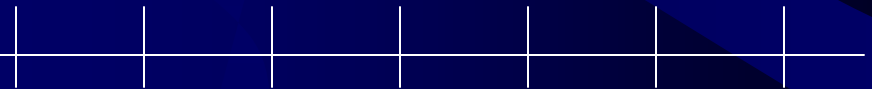
Operations with Integers

Including review of integers

Definition

- Positive number – a number greater than zero.

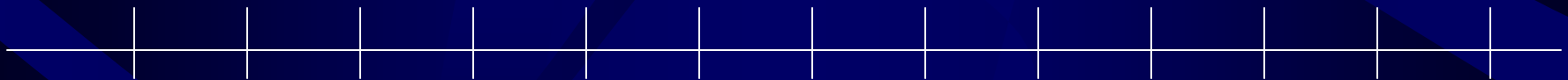
0 1 2 3 4 5 6



Definition

- Negative number – a number less than zero.

-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6



Definition

- Opposite Numbers – numbers that are the same distance from zero in the opposite direction

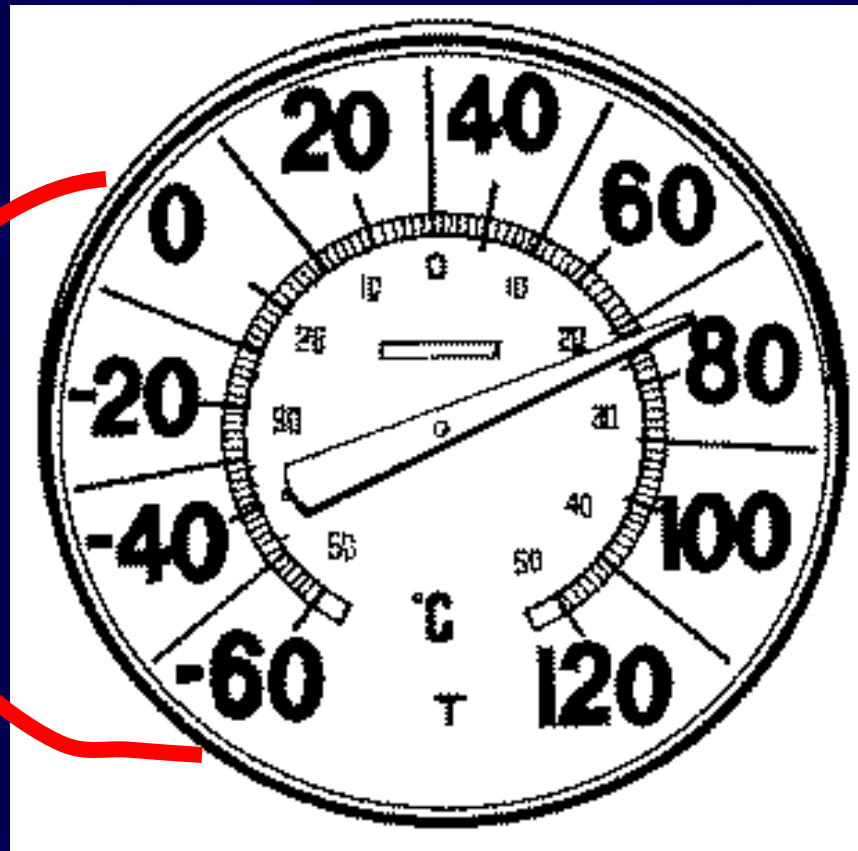


Definition

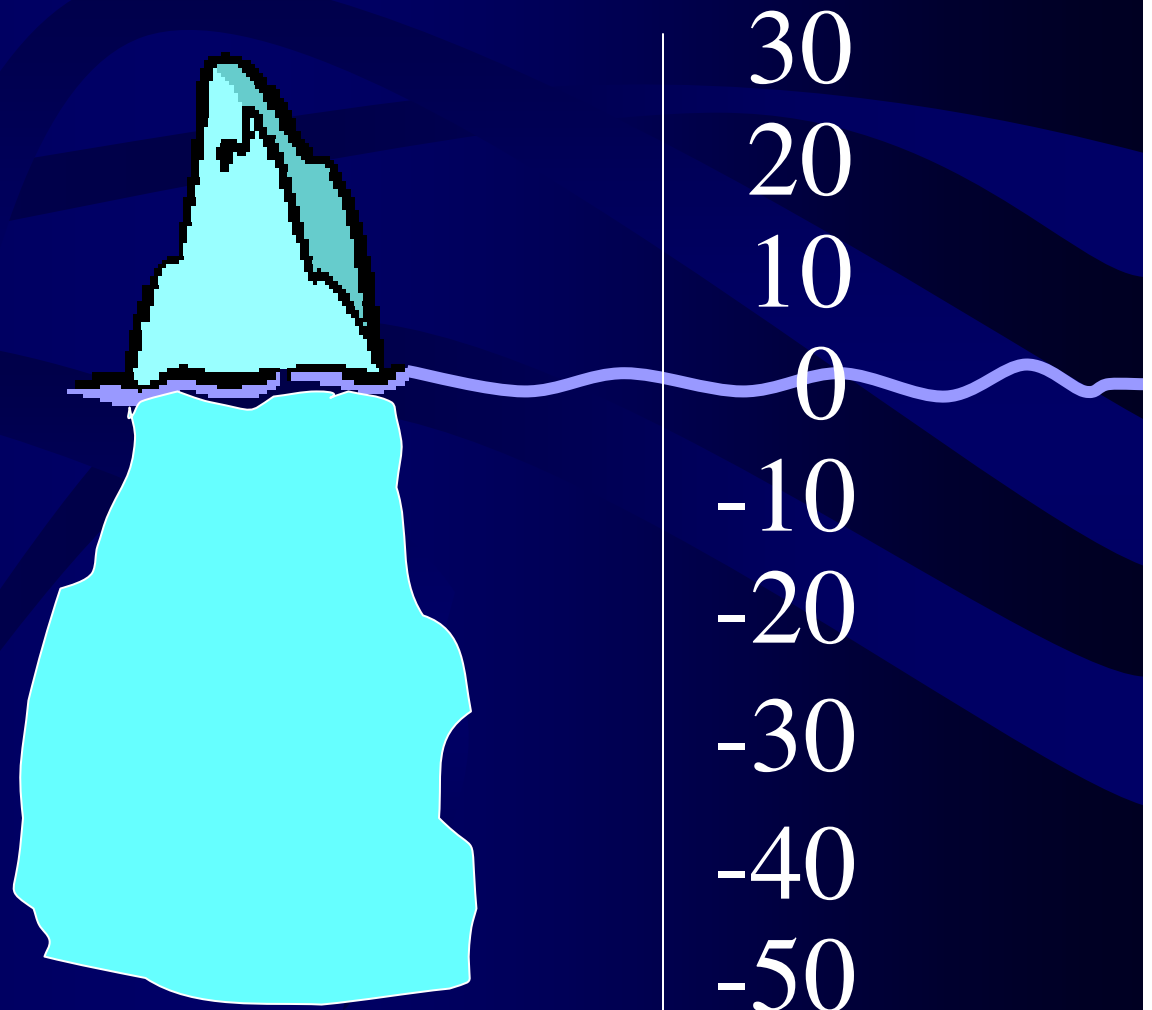
- Integers – Integers are all the whole numbers and all of their opposites on the negative number line including zero.

7 opposite -7

Negative Numbers Are Used to Measure Temperature



Negative Numbers Are Used to Measure Under Sea Level



Negative Numbers Are Used to Show Debt



Let's say your parents bought a car but had to get a loan from the bank for \$5,000. When counting all their money they add in $-\$5.000$ to show they still owe the bank.

Positive & Negative Numbers

Working with positive and negative numbers is like driving in traffic.

You have to watch the traffic signs and follow the driving rules.



Hint

- If you don't see a negative or positive sign in front of a number it is positive.

+9

Integer Addition Rules

- Rule #1 – If the signs are the same, pretend the signs aren't there. Add the numbers and then put the sign of the addends in front of your answer.

$$9 + 5 = 14$$

$$-9 + -5 = -14$$

Solve the Problems

$$\bullet -3 + -5 = -8$$

$$\bullet 4 + 7 = 11$$

$$\bullet (+3) + (+4) = 7$$

$$\bullet -6 + -7 = -13$$

$$\bullet 5 + 9 = 14$$

$$\bullet -9 + -9 = -18$$

Integer Addition Rules

- Rule #2 – If the signs are different pretend the signs aren't there. Subtract the smaller from the larger one and put the sign of the larger one in front of your answer.

Larger number $\textcircled{-9} + +5 =$

$9 - 5 = 4$ Answer = - 4

Solve These Problems

$$\bullet 3 + (-5) = \quad 5 - 3 = 2 \quad -2$$

$$\bullet -4 + 7 = \quad 7 - 4 = 3 \quad 3$$

$$\bullet (+3) + (-4) = \quad 4 - 3 = 1 \quad -1$$

$$\bullet -6 + 7 = \quad 7 - 6 = 1 \quad 1$$

$$\bullet 5 + (-9) = \quad 9 - 5 = 4 \quad -4$$

$$\bullet -9 + 9 = \quad 9 - 9 = 0 \quad 0$$

Adding Integers Song **“Row, Row, Row, Your Boat”**

**Same sign add and keep,
Different signs subtract,
Take the sign of the higher
number,
Then you’ll be exact.**

One Way to Add Integers Is With a Number Line

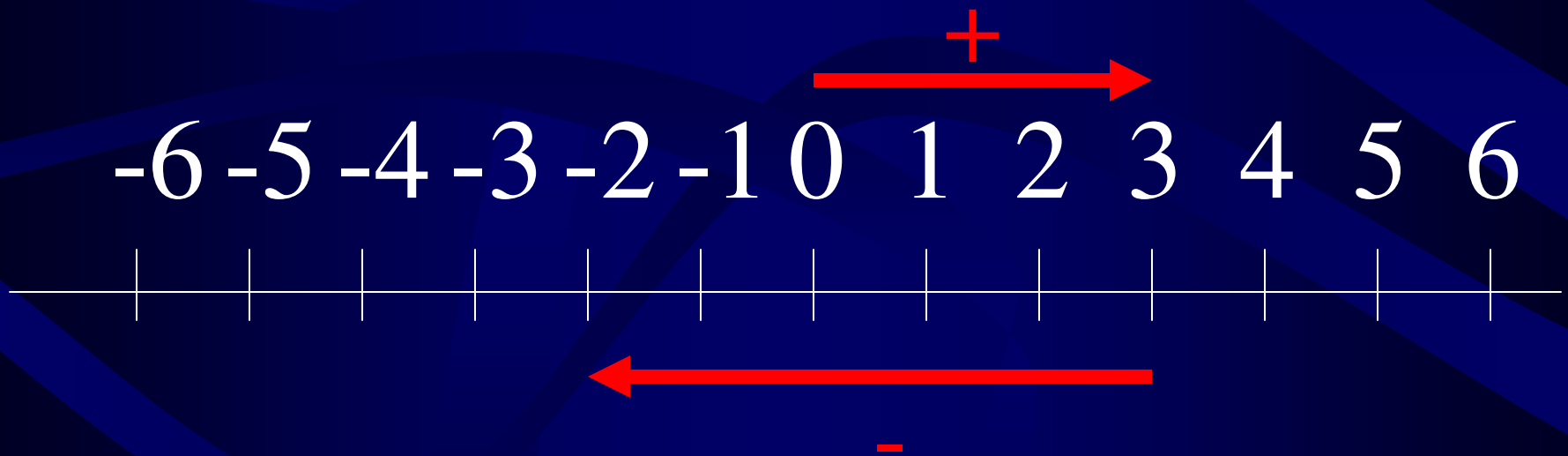
When the number is positive count
to the right.

When the number is negative count
to the left.



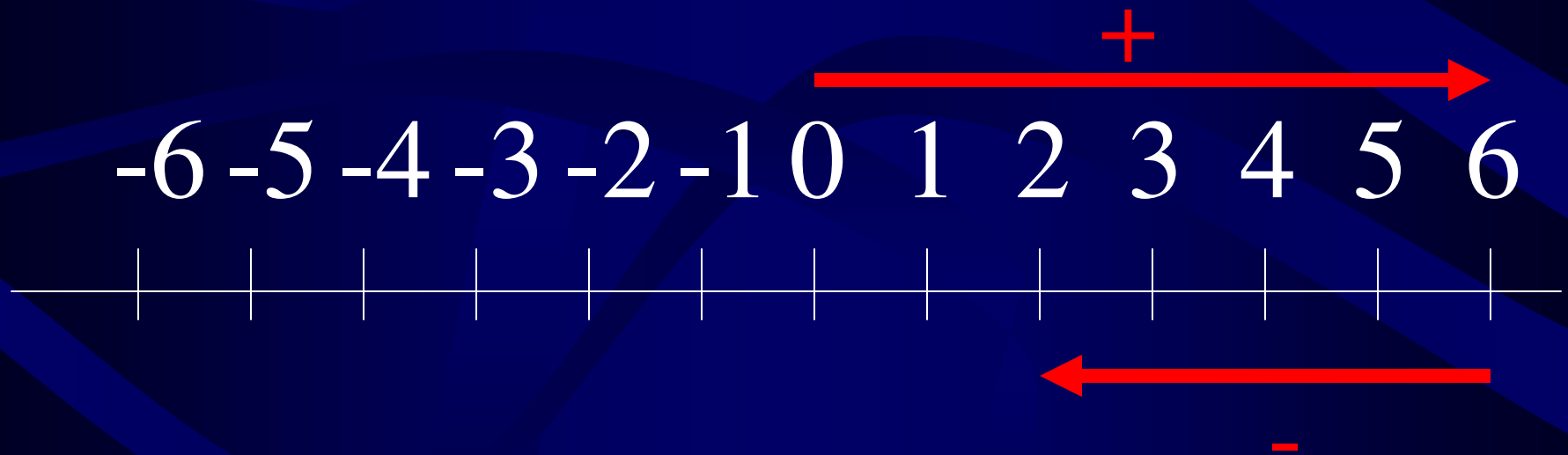
One Way to Add Integers Is With a Number Line

$$+3 + -5 = -2$$



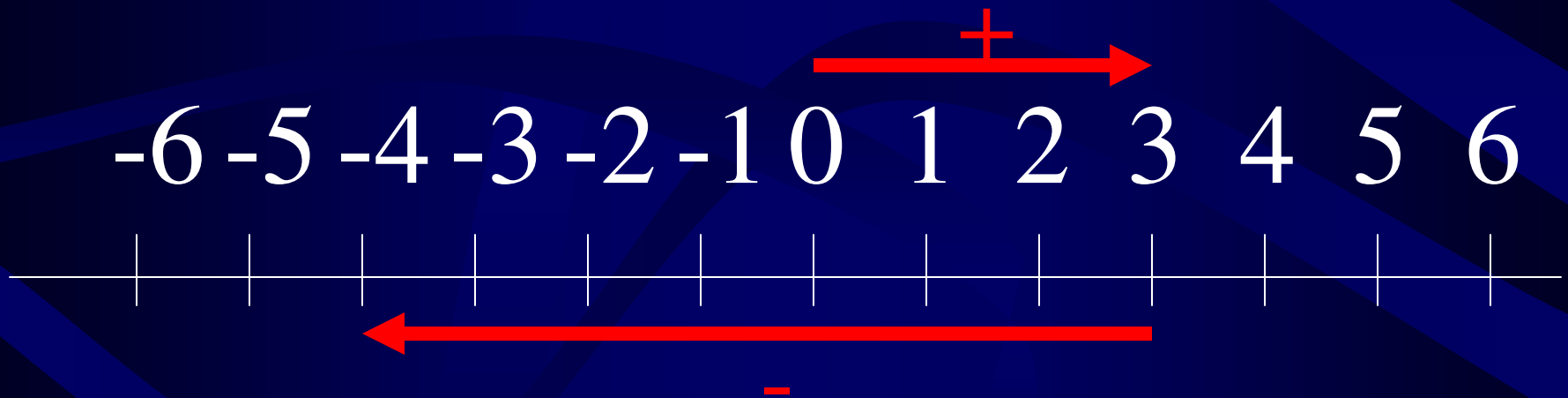
One Way to Add Integers Is With a Number Line

$$+6 + -4 = +2$$



One Way to Add Integers Is With a Number Line

$$+3 + -7 = -4$$



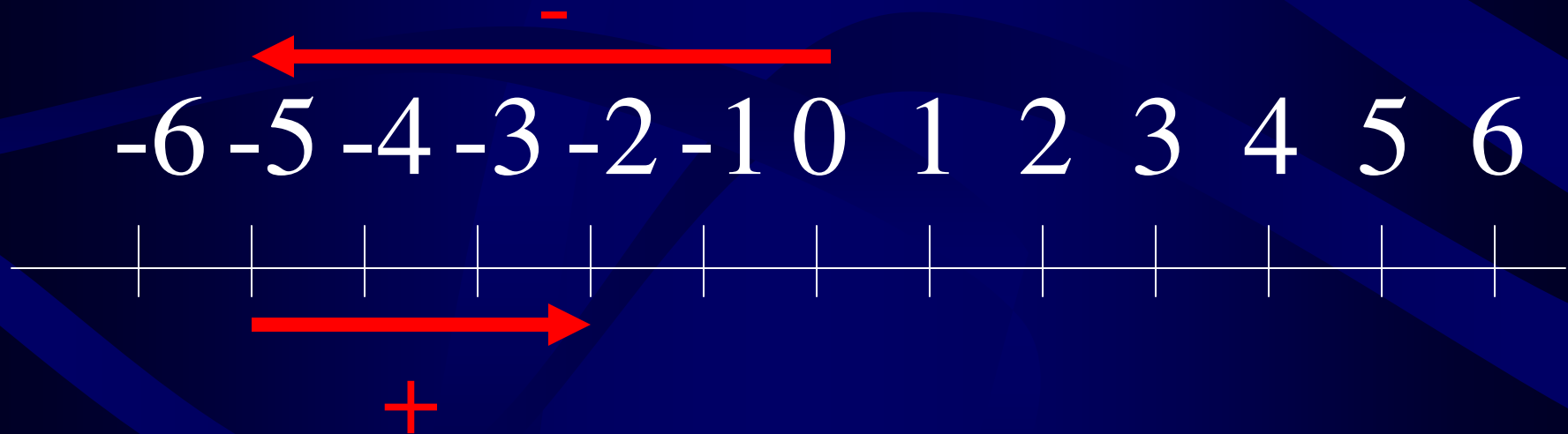
One Way to Add Integers Is With a Number Line

$$-3 + +7 = +4$$



One Way to Add Integers Is With a Number Line

$$-5 + +3 = +4$$



One Way to Add Integers Is With a Number Line

$$-2 + +8 = +6$$



One Way to Add Integers Is With a Number Line

$$-5 + +2 = -3$$



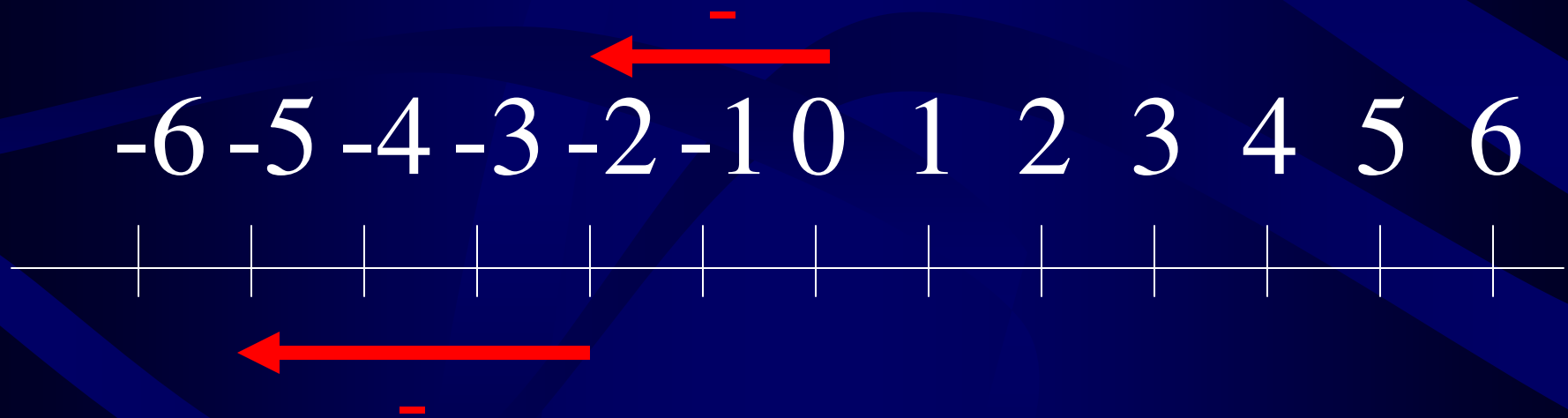
One Way to Add Integers Is With a Number Line

$$-4 + -2 = -6$$



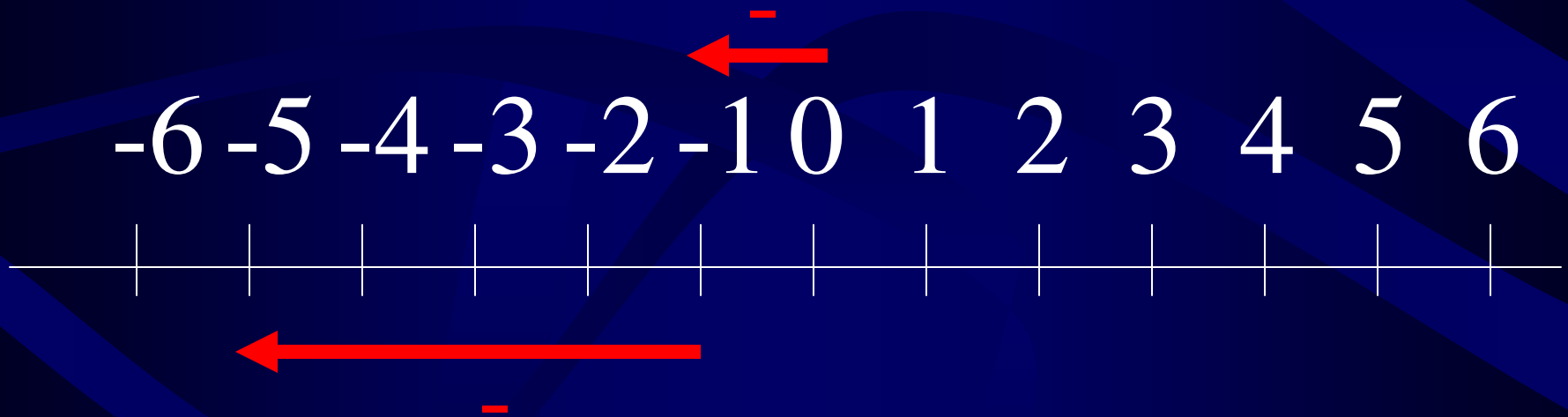
One Way to Add Integers Is With a Number Line

$$-2 + -3 = -5$$



One Way to Add Integers Is With a Number Line

$$-1 + -4 = -5$$



One Way to Add Integers Is With a Number Line

$$-4 + -1 = -5$$



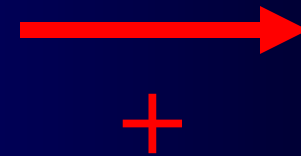
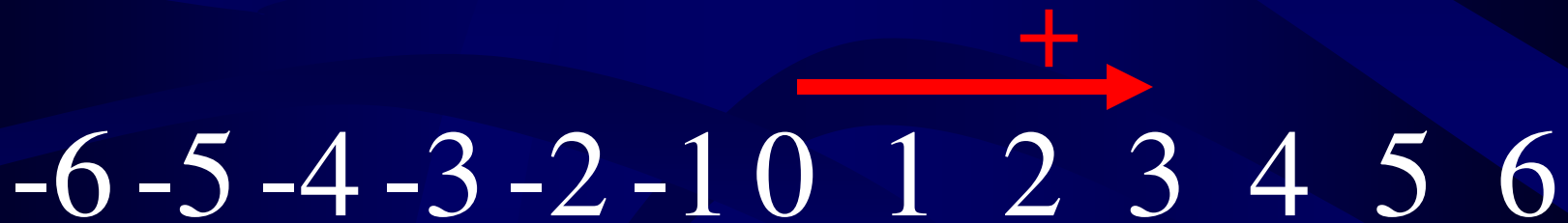
One Way to Add Integers Is With a Number Line

$$4 + 1 = 5$$



One Way to Add Integers Is With a Number Line

$$3 + 2 = 5$$



One Way to Add Integers Is With a Number Line

$$1 + 5 = 6$$



Subtracting Integers

- When subtracting integers, remember that a minus (-) sign is equivalent to a negative sign just like a plus (+) sign means positive.
- Instead of looking at the problem as a subtraction problem, look at the terms as a whole.

Ex. $\boxed{-3} \boxed{-4} \boxed{5} \boxed{-8}$

- Once you look at the terms as a whole you can follow the rules for adding integers (remember the song).

$$-3 - 4 = -7$$

$$5 - 8 = -3$$

Simplifying Multiple Negative Signs

Imagine that you had a conversation with someone and said, "I am not, not hungry." Because you used double negatives, the statement you made would actually mean that you were hungry. This can lead to confusion, and it definitely makes the sentence more complex than it needs to be. As a result, the use of double negatives in speech is generally considered improper. The same concept applies to mathematics.



- Occasionally you may encounter an algebraic expression or equation that has more than one sign between two terms. If there are two or more negative or subtract signs, then the expression or equation should be simplified.

Ex. 5 - -12 and -6 - -8

The two negatives cancel each other out and become positive.

$$5 + 12 = 17 \quad \text{and} \quad -6 + 8 = 2$$

Let's Practice

1. $4 - 7$

2. $12 - (-5)$

3. $-8 - 7$

4. $-22 - (-40)$