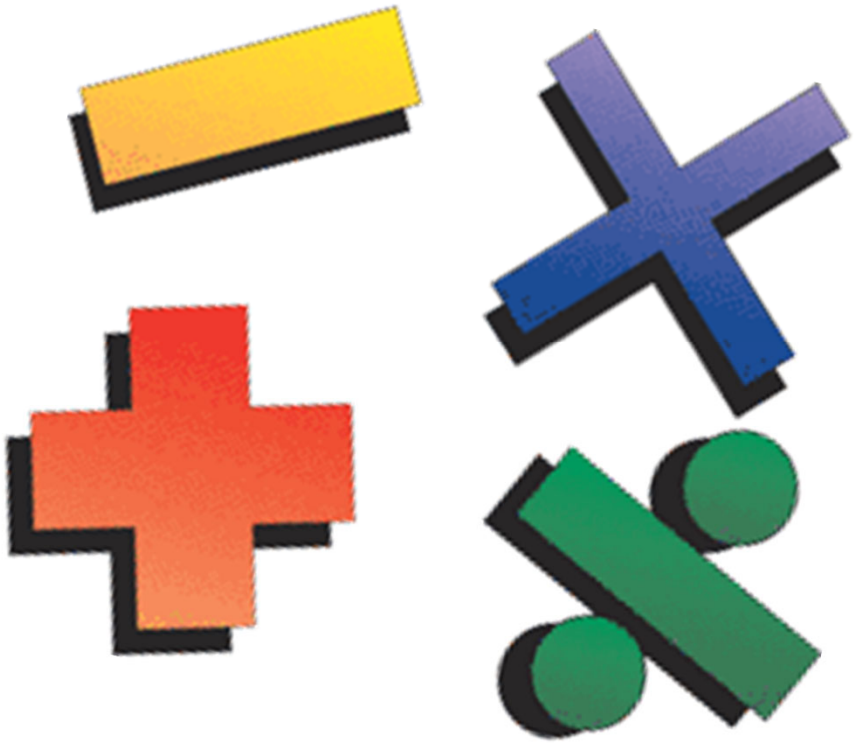
Integers & Order of Operations

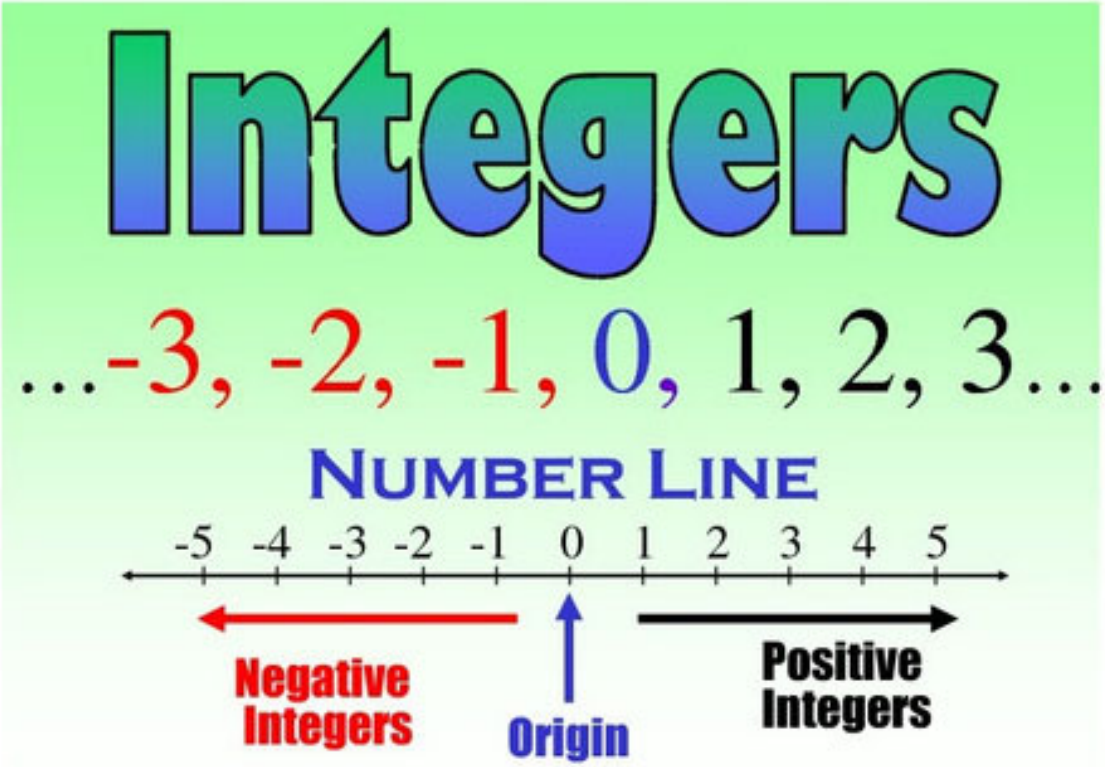
Math 8 Review



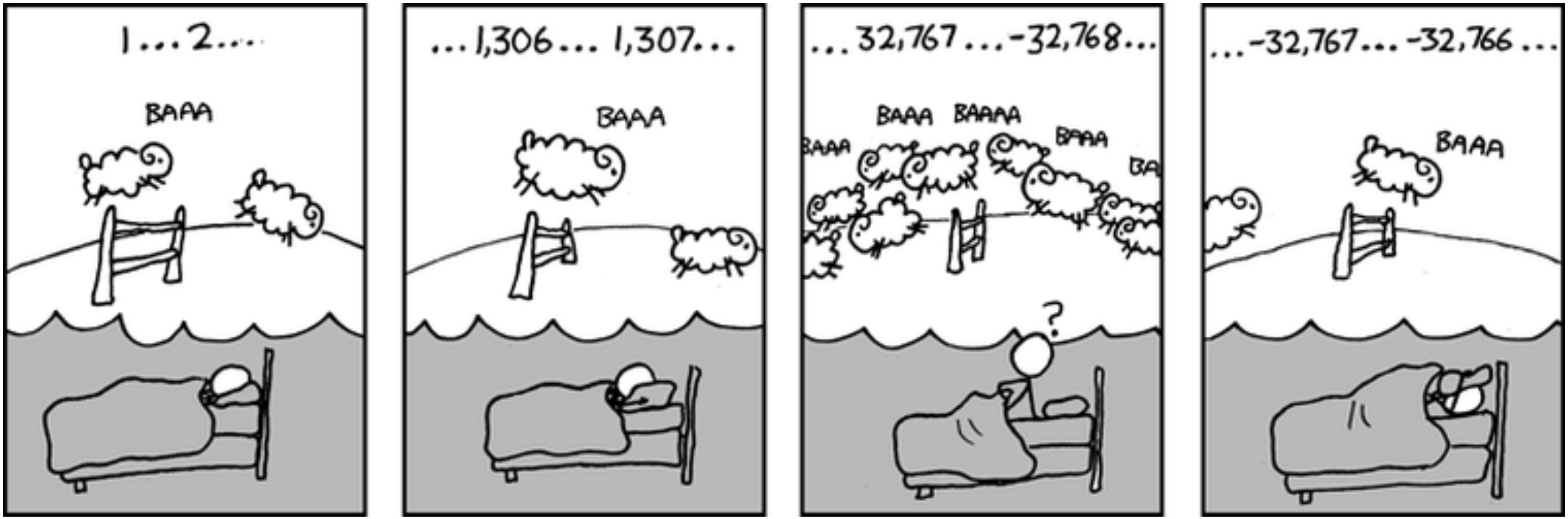
Math 9 – Mrs. Feldes

What are Integers?

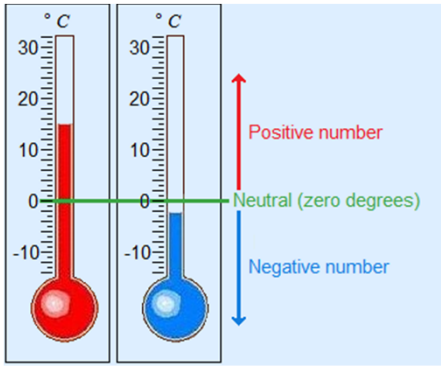
Integers are **positive & negative whole** numbers.



Positive & negative integers can describe <u>opposite</u> situations.

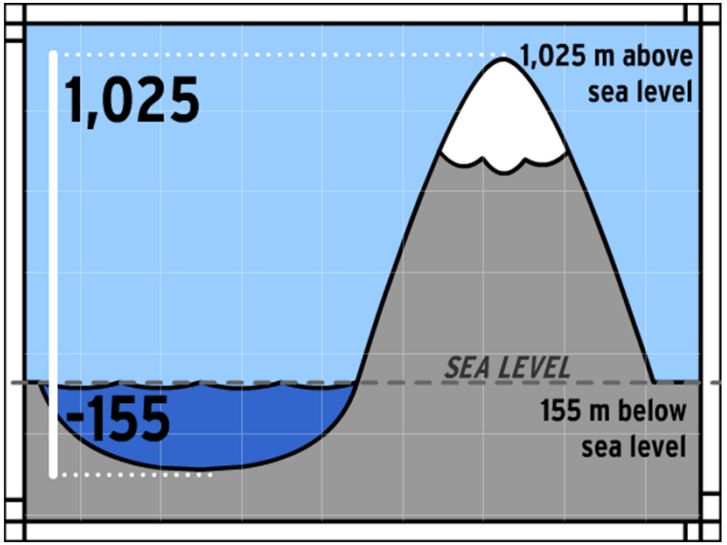


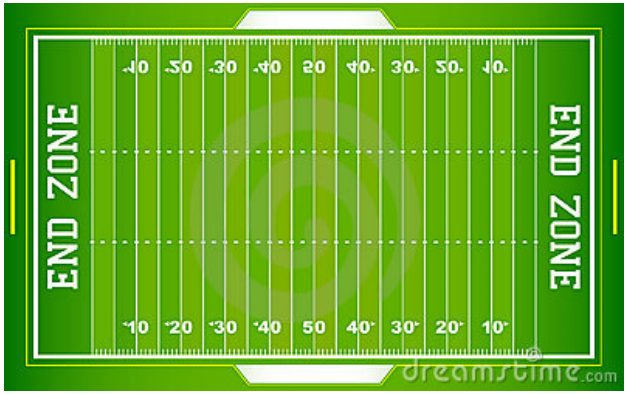
Positive Integers:



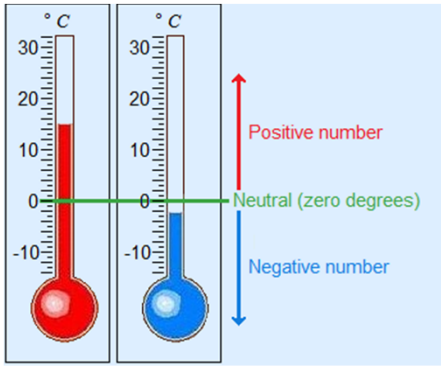
Positive Integers

- Depositing money in a checking account
- Elevation above sea level
- Any temperature above zero
- Yardage gained in football



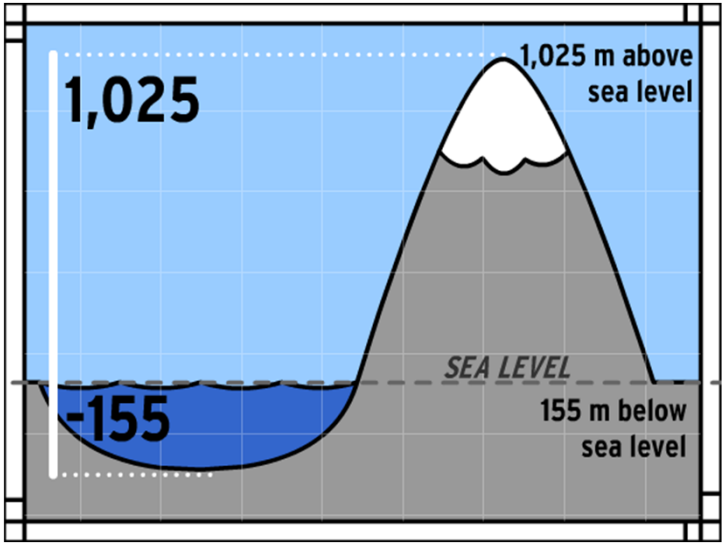


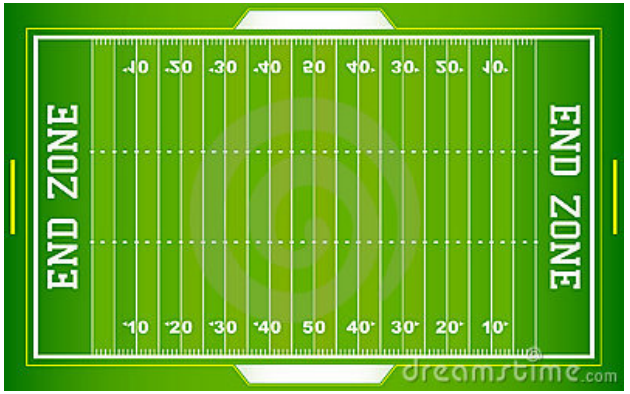
Negative Integers:



Negative Integers

- Withdrawing money from a checking account
- An elevation below sea level
- Below zero temperatures
- Yardage lost in football





Positive & Negative Integers:

A positive number **<u>can include</u>** the positive sign & brackets. However, a number without a sign is assumed to be positive.

$(+3) \times (+4)$ can be written as 3×4

A negative number **<u>must include</u>** the negative sign. The brackets are optional.

$(-9) \div (-3)$ can be written as $-9 \div -3$

Rules for Addition:

Adding **two positives** with result in a positive answer.

$$10 + 14 = 24$$

Adding positives is like earning money…

I made $10 babysitting & $14 for yard work!
I have $24 in total!

Rules for Addition:

Adding **two negatives** with result in a negative answer.

$$-25 + -5 = -30$$

Adding negatives is like spending money…

I spent $25 on a t-shirt & $5 on a calculator!
I spent $30 in total!

Rules for Addition:

What if the numbers have different signs?

$$-6 + 10 = +4$$

It is like an account balance or transaction…

I owe $6 to my friend & I have $10 in my pocket. I have $4 left!

Rules for Addition:

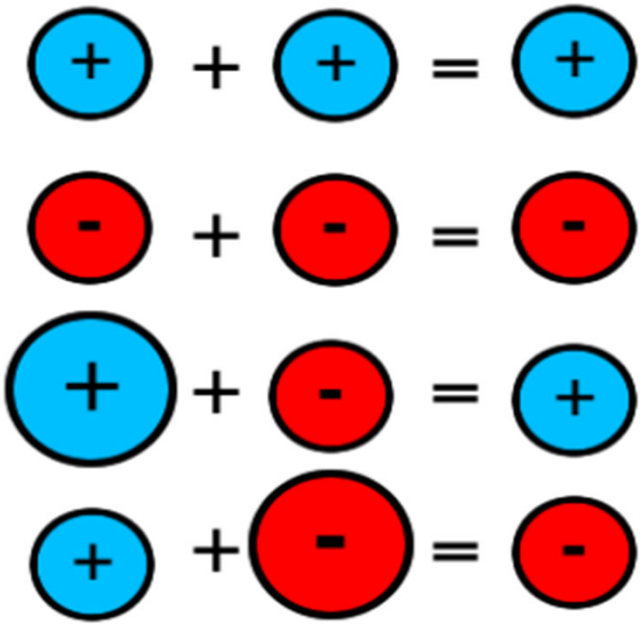
What if the numbers have different signs?

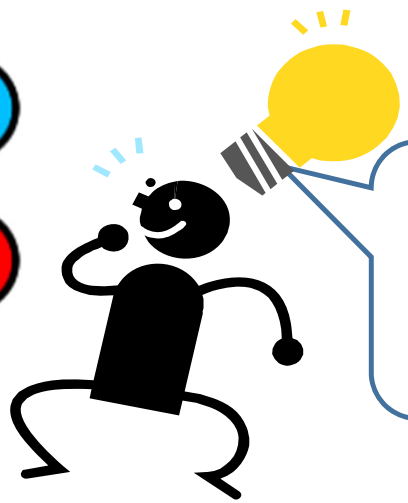
$$25 + (-80) = -55$$

It is like an account balance or transaction…

I have $25 in my account. I want to buy a pair of jeans for $80. I need to borrow $55!

Rules for Addition:



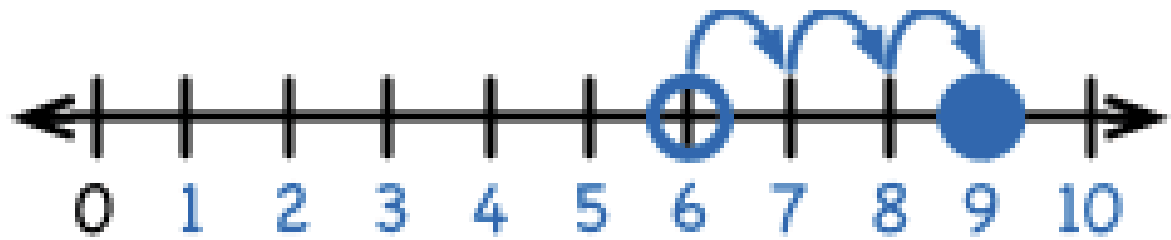


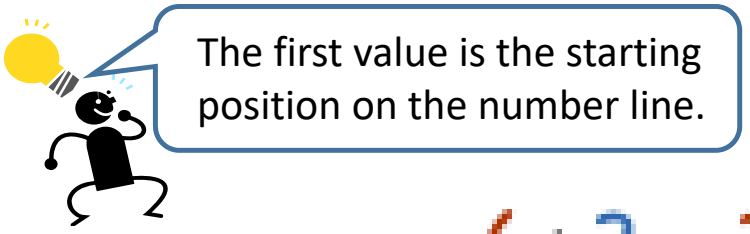
Notice: When the signs are mixed, the resulting sign is dependent on the sign of the ‘bigger’ number.

Visualize a Number Line:

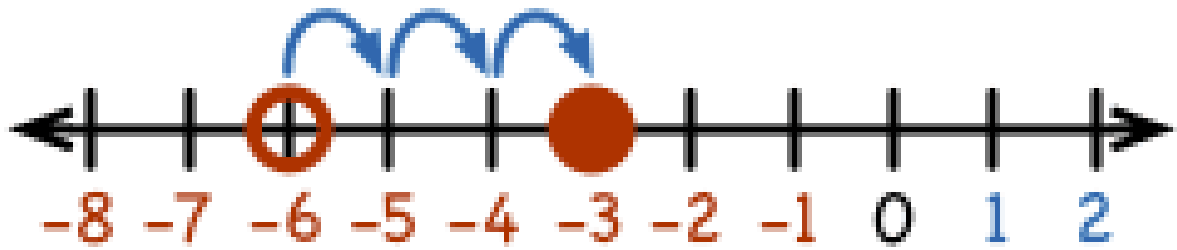
Add a **positive value** means to move to the **right**.

$6+3=9$





$-6+3=-3$



Visualize a Number Line:

Add a **negative value** means to move to the **left**.

Other Strategies…

Tidy up the "extra signs" & make a subtraction statement!

$$25 + (-80) = -55$$
$$25 - (+80) = -55$$
$$25 - 80 = -55$$

Adding a Negative

is the same as

Subtracting a Positive

Why is this true?

Addition & Subtraction are **<u>inverse operations</u>**.

"If two negatives make a positive how come two wrongs don't make a right?"

This means you can make **equivalent statements** for either addition or subtraction.

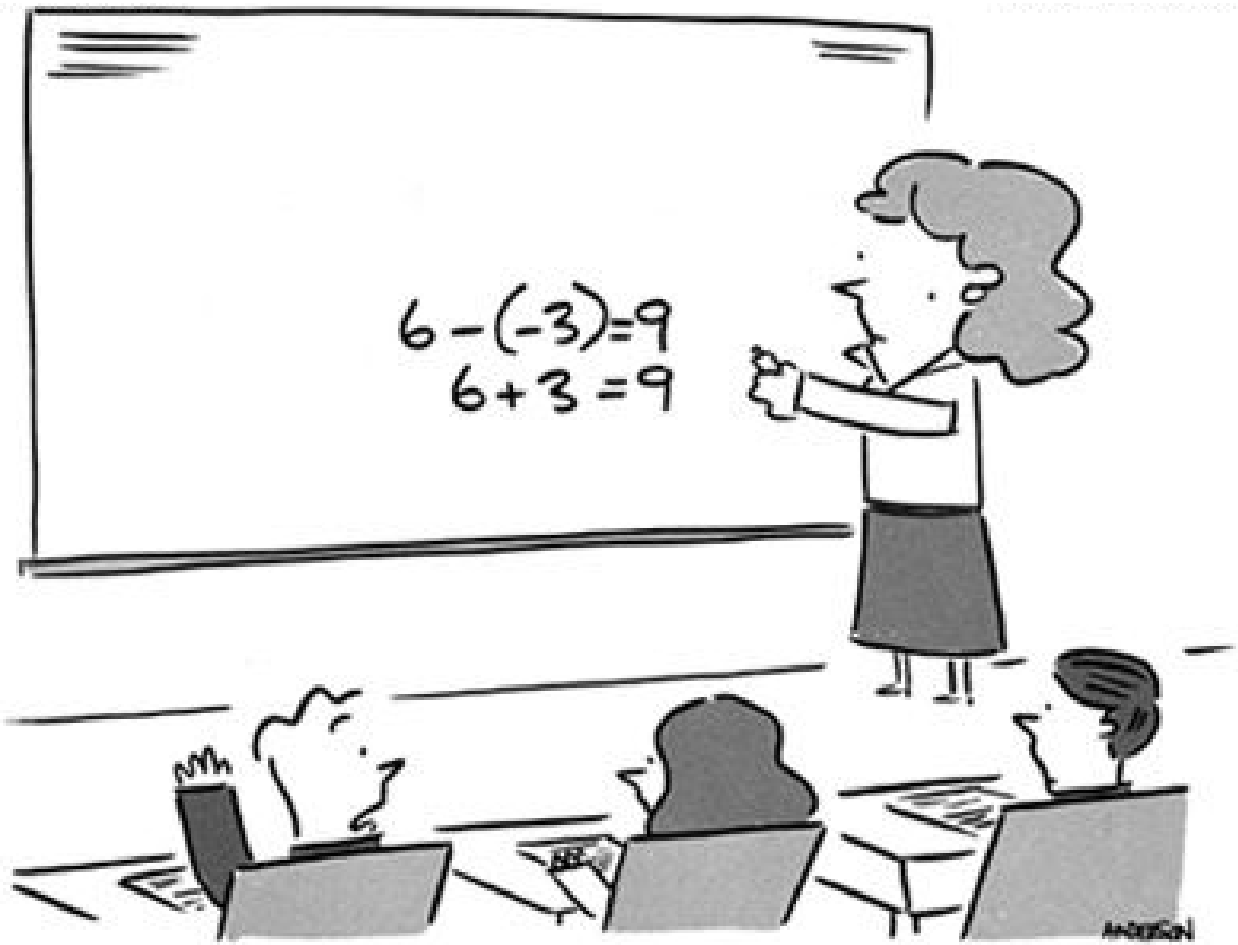
Rules for Subtraction:

When the signs are different, write one subtraction sign!

$$55 + -36 = 19 \qquad \boldsymbol{OR} \qquad 55 - 36 = 19$$

When the signs are the same, write one addition sign!

$$27 - -31 = 58 \qquad \boldsymbol{OR} \qquad 27 + 31 = 58$$



"So in English a double negative is bad, but in math it's *a positive*?"

Rules for Subtraction:

$$-26 - 64 = -90$$
$$-26 + (-64) = -90$$

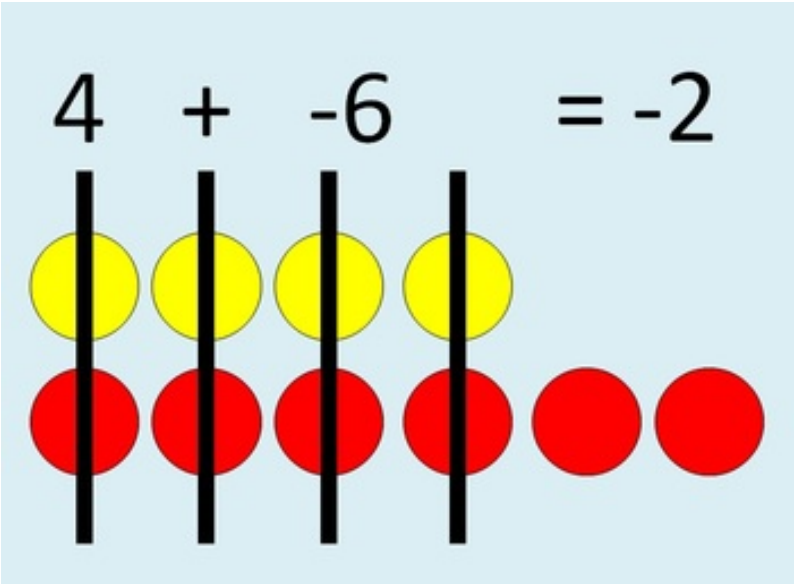
Subtracting a Positive
is the same as
Adding a Negative

Visualize Counting Chips:

A yellow chip represents a positive value.

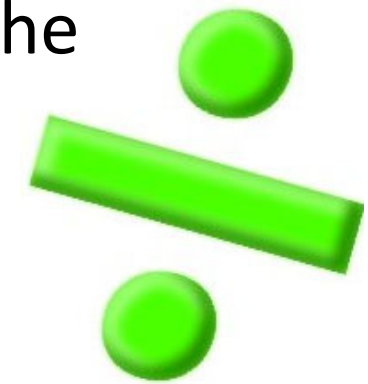
A red chip represents a negative value.

Therefore, one red chip & one yellow chip equals zero.



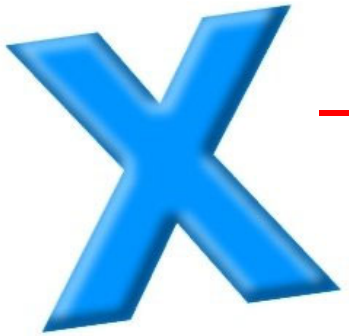
Rules for Division & Multiplication:

The product or quotient of two integers with the **<u>same signs</u>** is positive.



$$-3 \times -4 = 12 \quad \text{or} \quad -12 \div -4 = 3$$

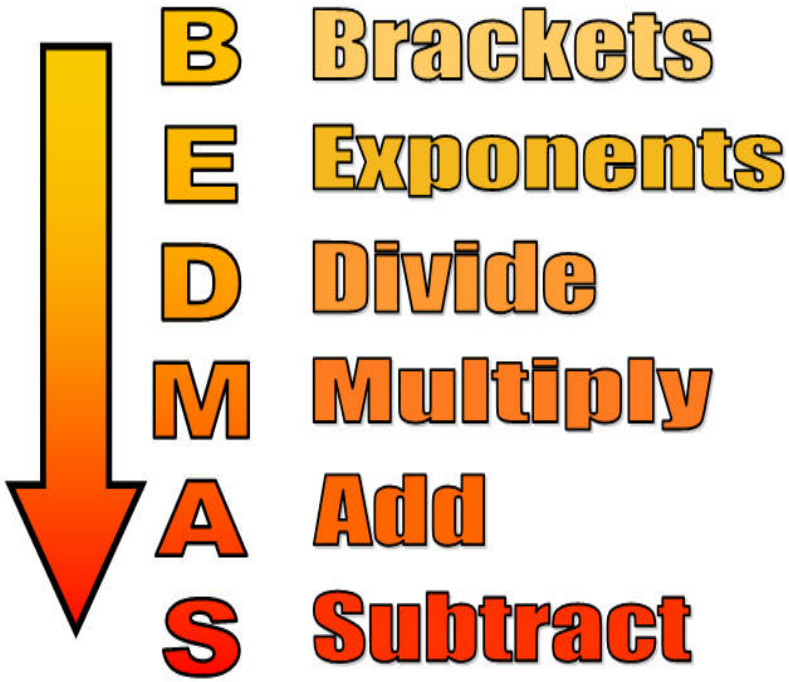
The product or quotient of two integers with **<u>different signs</u>** is negative.



$$-3 \times 4 = -12 \quad \text{or} \quad -12 \div 4 = -3$$

What is BEDMAS?

"BEDMAS" is an acronym that describes the order in which a mathematical expression is simplified.



LETS WATCH….

Math Antics: Order of Operations

Why do we need BEDMAS?

To arrive at the **correct answer**!

If we didn't have rules about the order a question is completed – many different answers would be possible.

IN CONCLUSION:

B Brackets
E Exponents
D Divide
M Multiply
A Add
S Subtract

Divide/Multiply
and
Add/Subtract
must be completed
from
LEFT TO RIGHT!

IN CONCLUSION:

SHOW YOUR WORK ONE LINE AT A TIME
WORK DOWN YOUR PAGE!

Example:

$$30 + \underline{9 \times 11} \div -3$$

$$30 + \underline{99 \div -3}$$

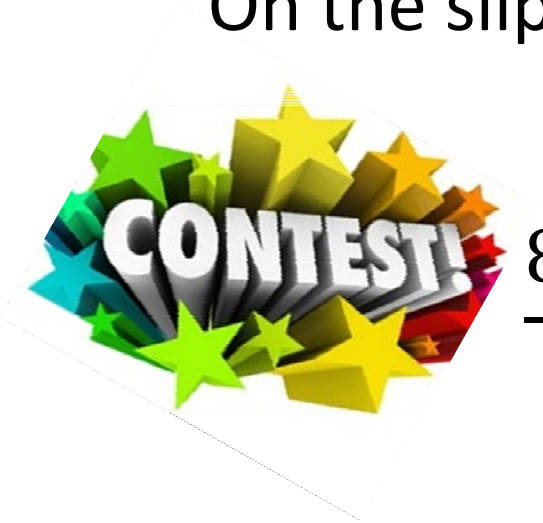
$$30 + -33$$

$$-3$$

B Brackets
E Exponents
D Divide
M Multiply
A Add
S Subtract

Skill Testing Question:

On the slip provided, answer the following question:



$$\frac{8 \times [3 + (-23)] - 5 - -12}{-9 \div -3 - 4}$$

Hand-in your slip for your chance to win!