Lesson 2 - Adding and Subtracting Integers

Name: _____ Date: _____ Block: _____

STEM - Math 8
Unit 1 – Integers

Lesson 2 – Adding and Subtracting Integers

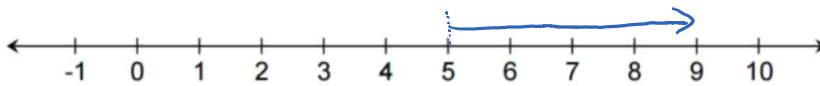| Goals:	Warm – up: *Can you remember how to add 5 + (-3)?*
- Add integers	2
- Subtract integers	

Adding two positive integers:
To add two positive integers, add their numerical values. The result is positive.

Ex: Use a number line to show the sum of 5 and +4, then show it numerically:
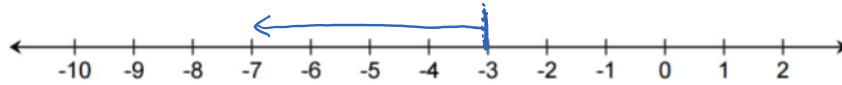
$$5+(+4)=+9$$

Adding two negative integers:
To add two negative integers, add their numerical values. The result is negative.

Ex: Use a number line to show the sum of (-3) and (-4), then show it numerically:

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

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

Adding a positive and negative integer: subtract
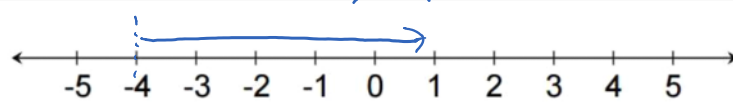To add a positive and negative integer, find the difference of their numerical values.
  ➢ If the number with the larger numerical value is positive, the result is positive.
  ➢ If the number with the larger numerical value is negative, the result is negative.

Ex: Use a number line to show the sum of (+5) and (-4) two different ways, then show it numerically:
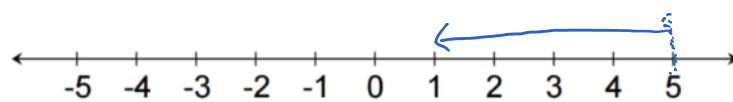
$$(+5)+(-4)=+1$$
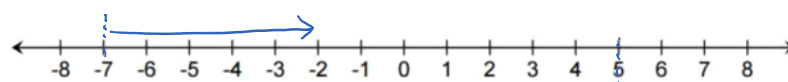$$(+5)+(-4)=1$$

$$(-4)+(+5)=+1$$
$$(-4)+(+5)=1$$

Ex: Use a number line to show the sum of (-7) and 5. Then show it numerically.

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

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

Subtracting Integers

Complete the following table, describe any patterns:

4 − 2 =	2
4 −1 =	3
4 − 0 =	4
4 − (-1) =	5
4 − (-2) =	6

When we subtract integers using a number line, we go the opposite way of that we would go using integer addition:

Ex:

3+ (+2) =	VS	3 − (+2) =

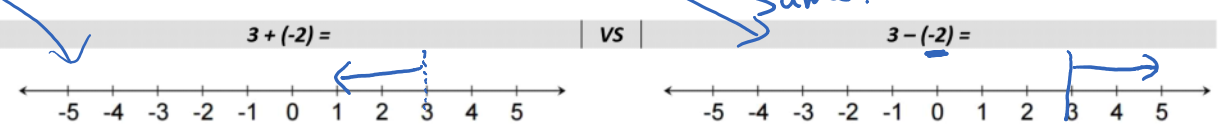-5 -4 -3 -2 -1 0 1 2 3 4 5   -5 -4 -3 -2 -1 0 1 2 3 4 5

Same!
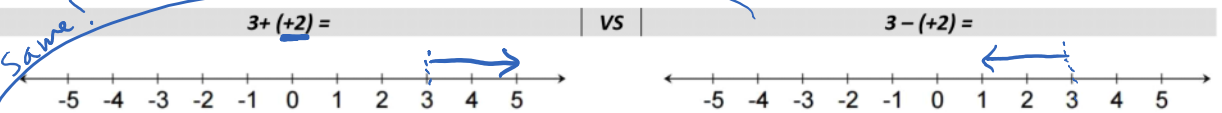
Try the table below and compare the results to the table above.

3 + (-2) =	VS	3 − (-2) =

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

Same!

This translates to **adding the opposite integer**, when we subtract integers numerically, as we can see with the relationship above.

> Turn all the integer subtraction into integer addition by changing the second number to its integer opposite and adding it.

Ex:

$5 - (-12) = 5 + (+12) = 17$ $10 - (+22) = 10 + (-22) = -12$

$-8 - (+ 32) = -8 + (-32) = -40$ $(- 7) - (- 23) = (-7) + (+23) = +16$
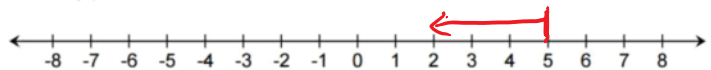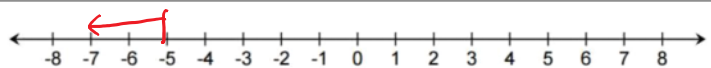
ASSIGNMENT – NO CALCULATORS

Level 1:

1. Use the number lines to help with the following problems:
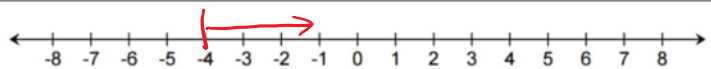
   a. $5 + (-3) =$ ___2___

   -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8

   b. $-5 + (-2) =$ ___-7___

   -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8

   c. $- 4 - (-3) =$ ___-1___

   -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8

2. Find each sum or difference:

a. $-12 + 7 =$ __−5__

b. $-8 + (-4) =$ __−12__

c. $16 + (-8) =$ __8__

d. $(-8) - (-2) =$ __−4__

e. $(-7) - 4 =$ __−11__

f. $8 - (-7) =$ __15__

Level 2:

3. Find each sum, difference, or missing number:

a. $-9 + (-2) =$ __−11__

b. $-19 +$ __3__ $= -16$

c. $-4 +$ __12__ $= 8$

d. $-12 +$ __(−12)__ $= -24$

e. __(−12)__ $+ 12 = 0$

f. $-4 + (-3) + 7 =$ __0__

g. $-14 + 3 + (-2) =$ __−13__

h. $(-8) + (-2) + 14 =$ __4__

i. $34 + (-12) + 4 =$ __26__

j. $38 - (-17) =$ __55__

k. $(-16) - (-36) =$ __20__

l. $(-6) - 24 =$ __−30__

m. $20 -$ __28__ $= -8$

n. $12 -$ __(−2)__ $= 14$

o. $-3 -$ __3__ $= -6$

p. $16 - (-13) - (-5) =$ __34__

q. $(-7) - (-2) - 9 =$ __−4__

4. The temperature in Anchorage, Alaska was 8°F in the morning and dropped to -5°F in the evening. What is the difference between these temperatures? *You **must** draw a diagram to receive full credit for this problem.*
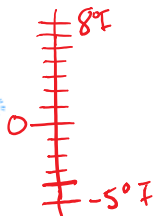
Final − initial = difference

$(-5) - (+8)$

$-5 + (-8) = -13°$
      ↑
   dropped.

} the temperature dropped −13°F

Level 3:

5. Evaluate:

a. $(-3) + 12 - 6 + (-18) =$ −15	b. $(-3) + 5 + (-5) + 12 =$ +9
c. $(-11) - 8 + 1 - (-6) =$ −12	d. $10 - (-10) - 7 - 5 =$ 8

6. Evaluate and put into simplest terms:

a. $5.8 + (-2.5) =$ $+3.3$	b. $1.8 - (-3.5) =$ 5.3
c. $-\dfrac{1}{2} + \dfrac{3}{2} =$ $\dfrac{1}{2}$	d. $\dfrac{7}{4} - \left(-\dfrac{1}{2}\right) =$ $\dfrac{7}{4} + \left(+\dfrac{2}{4}\right) = \dfrac{9}{4} = 2\dfrac{1}{4}$
e. $\left(-\dfrac{1}{5}\right) + \dfrac{7}{4} =$ $\left(-\dfrac{4}{20}\right) + \dfrac{35}{20} = \dfrac{-31}{20} = -1\dfrac{11}{20}$	f. $\dfrac{2}{5} - \dfrac{4}{3} =$ $\dfrac{6}{15} - \dfrac{20}{15} = \dfrac{-18}{15} = -1\dfrac{3}{15}$

Show your work for the problems below:

7. In Buffalo, New York, the temperature was -14°F in the morning. If the temperature dropped 7°F, what is the temperature now?

$$-14 - (7) = -21°F$$

8. Metal mercury at room temperature is a liquid. Its melting point is -39°C. The freezing point of alcohol is -114°C. How much warmer is the melting point of mercury than the freezing point of alcohol?

$$-39° - (-114°C)$$
$$= 75°C$$

ANSWERS: