

ADDING & SUBTRACTING ON THE NUMBER LINE

2

Name: Key Date: _____ Period: _____

SECTION 2.1 ADDITION OF INTEGERS

Big Ideas: How do we model addition on a number line?

In order to model addition on a number line, we use the **Four-Step Car Model** for addition.

Step 1: Place your car at the origin, 0, on the number line.

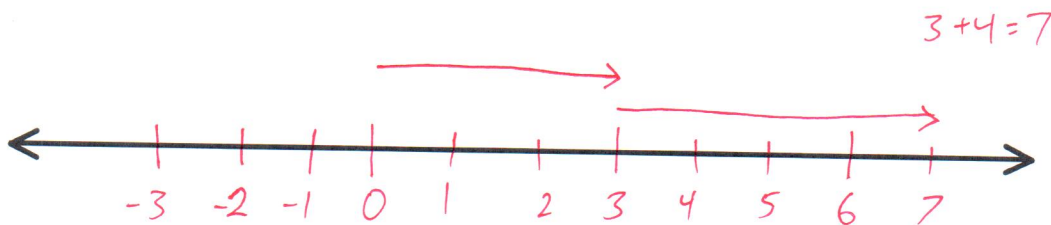
Step 2: Look at the sign on the first number. If the number is positive, point the car to the right, if the number is negative, point the car to the left. *Move the car forward by a distance equal to the absolute value of the first number.*

Step 3: Next, examine the sign on the second number. If the number is positive, point the car to the right, if the number is negative, point the car to the left.

Step 4: Because you are adding, move the car forward, the way that it is facing, the distance equal to the absolute value of the second number.

EXAMPLE 1

Apply the Four-Step Car Model to find the sum $3 + 4$. Explain what you did in each step using the number line.



Step 1: Place car at 0

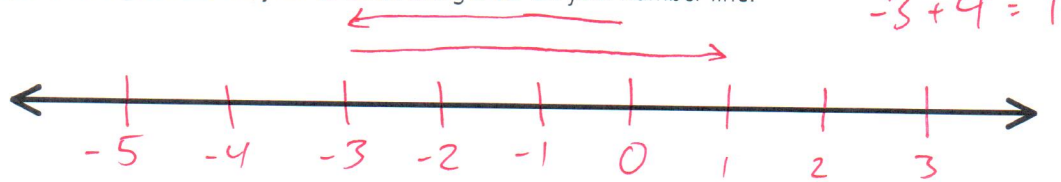
Step 2: Face car right, move forward 3

Step 3: Face car right

Step 4: Move forward 4 units (to 7)

EXAMPLE 2

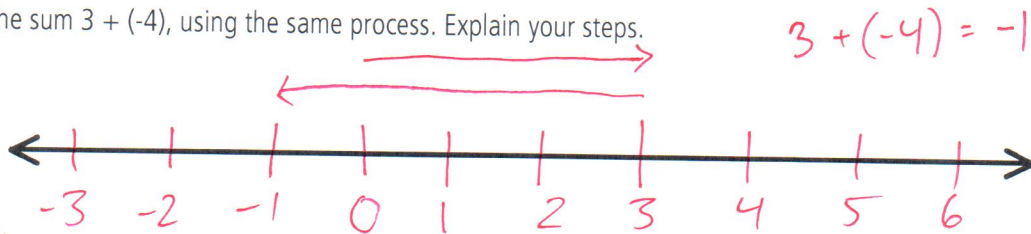
Find the sum $-3 + 4$. How do we start the process? In which direction does your car move first and how far? Explain how you reached your solution using a car on your number line.



1. Place car at 0
2. Face car to the left, move forward 3 (which is $|-3|$)
3. Face car to the right
4. Move forward 4 units (to 1)

EXAMPLE 3

Find the sum $3 + (-4)$, using the same process. Explain your steps.



Step 1:

Place car at 0.

Step 2:

Face car right, drive forward 3

Step 3:

Face car left

Step 4:

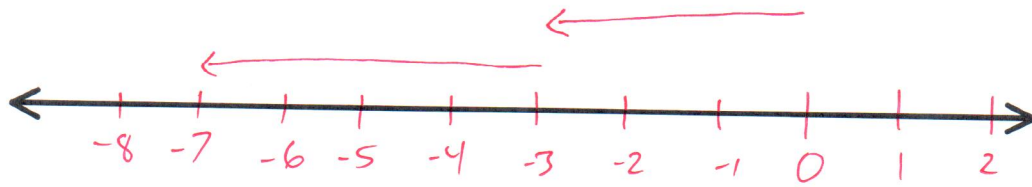
Drive forward 4 units (to -1)

↑
|-4|

EXAMPLE 4

Find the sum $-3 + (-4)$, using the same process.

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



Step 1: Place car at 0.

Step 2: Face car left, drive forward 3.

Step 3: Face car left (still)

Step 4: Drive forward 4 (to -7)

PRACTICE EXERCISES

Find the sum using your car if needed.

- | | | | |
|------------------------|---------------------|-------------------|-------------------|
| 1. a. $5 + 9$
14 | b. $-9 + -5$
-14 | c. $-5 + 9$
4 | d. $-9 + 5$
-4 |
| 2. a. $-6 + -4$
-10 | b. $6 + 4$
10 | c. $-6 + 4$
-2 | d. $-4 + 6$
2 |

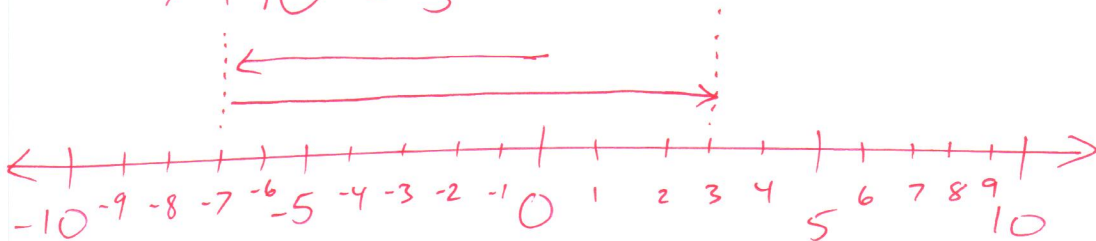
3. Lisa checks the temperature and it is 5°C on a cold winter day in Big Bend. Later that night the temperature drops 8°C . What is the new temperature?

$$5^{\circ}\text{C} - 8^{\circ}\text{C} = \boxed{-3^{\circ}\text{C}}$$



4. If a football player loses 7 yards during one play, then gains 10 yards on the next play, what is the net gain or loss? Demonstrate how to use addition on the number line to solve this problem.

$$-7 + 10 = 3$$



SUMMARY (What I learned today)
