Unit 7, Lesson 10

Finding Differences

Let's bring addition and subtraction together.

10.1 Math Talk: Unknown Addend

Solve each equation mentally.

- $247 + c = 458$
- $c + 389 = 721$
- $c + 43.87 = 58.92$
- $\frac{15}{8} + c = \frac{51}{8}$

10.2 Expressions with Altitude

A mountaineer is changing elevations. The table shows some beginning and final elevations.



beginning elevation (feet)	final elevation (feet)	difference between final and beginning	change (feet)
+400	+900	$900 - 400$	+500
+400	+50		
+400	-120		
-200	+610		
-200	-50		
-200	-500		
-200	0		

For each row of the table:

1. Write an expression that represents the difference between the final elevation and the beginning elevation.
2. Find the change in the mountaineer's elevation in feet. Explain or show your reasoning.

Are you ready for more?

Fill in the table so that every row and every column sums to 0. Can you find another way to solve this puzzle?

	-12	0		5
0			-18	25
25		-18	5	-12
-12				-18
	-18	25	-12	

	-12	0		5
0			-18	25
25		-18	5	-12
-12				-18
	-18	25	-12	

10.3 Does the Order Matter?

Your teacher will assign you to work on either column A or column B. Your partner will work on the other column.

1. Find the value of each subtraction expression in your assigned column.

A
$3 - 2$
$4 - 7$
$5 - (-9)$
$(-11) - 2$
$(-6) - (-3.5)$
$(-1.2) - (-8.6)$
$(-2\frac{1}{4}) - (-3\frac{1}{4})$

B
$2 - 3$
$7 - 4$
$(-9) - 5$
$2 - (-11)$
$(-3.5) - (-6)$
$(-8.6) - (-1.2)$
$(-3\frac{1}{4}) - (-2\frac{1}{4})$

2. Compare answers with your partner.
3. What do you notice about the expressions and values in Column A compared to Column B?

10.4 Phone Inventory

A store tracks the number of cell phones it has in stock and how many phones it sells.

The table shows the inventory for one phone model at the beginning of each day last week. The inventory changes when they sell phones or get shipments of phones into the store.

	inventory	change
Monday	18	-2
Tuesday	16	-5
Wednesday	11	-7
Thursday	4	-6
Friday	-2	20

1. What do you think it means when the change is positive? Negative?

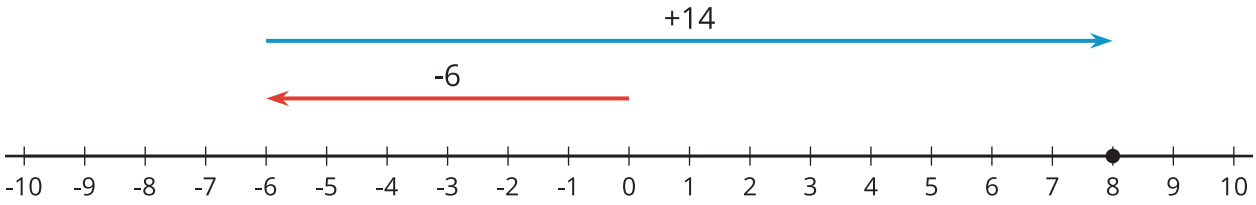
2. What do you think it means when the inventory is positive? Negative?

3. Based on the information in the table, what do you think the inventory will be on Saturday morning? Explain your reasoning.

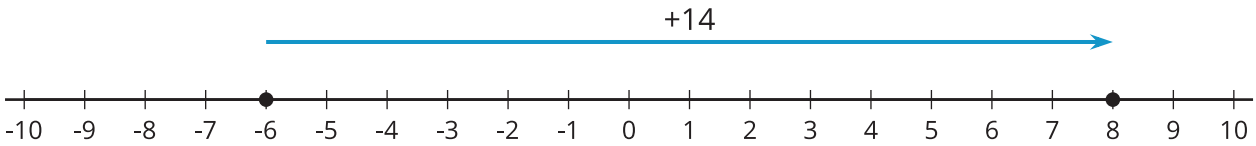
4. What is the difference between the greatest inventory and the least inventory?

Lesson 10 Summary

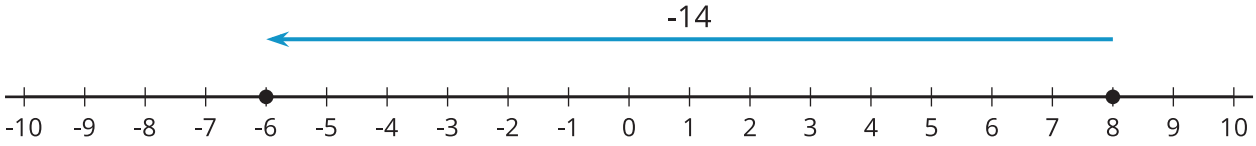
To find the difference between two numbers, we subtract them. Usually, we subtract them in the order they are named. For example, "the difference of +8 and -6" means $8 - (\text{-}6)$. We can find the value of $8 - (\text{-}6)$ by thinking $\text{-}6 + ? = 8$. Representing this on a number line, we can see that the second arrow must be 14 units long, pointing to the right.



The difference of two numbers tells us how far apart they are on the number line and in which direction. The difference of +8 and -6 is 14 because these numbers are 14 units apart, and 8 is to the right of -6.



If we subtract the same numbers in the opposite order, we get the opposite number. For example, "the difference of -6 and +8" means $\text{-}6 - 8$. This difference is -14 because these numbers are 14 units apart, and -6 is to the left of +8.



In general, the distance between two numbers a and b on the number line is $|a - b|$. Note that the *distance* between two numbers is always positive, no matter the order. But the *difference* can be positive or negative, depending on the order.