

Sect 1.2 - Addition of Whole Numbers and Perimeter

Objective a: Understanding properties of addition.

To illustrate some important properties involving addition, let's look at some examples.

Find the following:

Ex. 1a $9 + 5$

Solution:

$$9 + 5 = 14$$

Ex. 1b $5 + 9$

Solution:

$$5 + 9 = 14$$

Notice that both problems give us the same answer; it does not matter which order we write the numbers, the result is the same. This property of addition is called the **Commutative Property of Addition**.

Commutative Property of Addition

$$a + b = b + a$$

This property is easy to remember if you think of your daily commute from home to work. At the beginning of the day, you leave home (a) to go to work (b), so $a + b$. Then, at the end of the day, you do that commute backwards from work (b) to home (a), so $b + a$. There are many actions that are commutative. For example, at dinner, you can serve the meal and then pour the beverages or you could pour the beverages and then serve the meal. The order does not matter since either way produces the same result. So, we could say serving the meal and pouring beverages are "commutative". There are some actions that are not commutative like putting on socks and shoes. Here, order is important since you have to put on your socks first and then the shoes. It does not work the other way around (my son tried that when he was about three so he can personally attest that you cannot put on your shoes on and then your socks!).

Find the following:

Ex. 2a $(8 + 4) + 5$

Solution:

$$(8 + 4) + 5 = 12 + 5 = 17.$$

Ex. 2b $8 + (4 + 5)$

Solution:

$$8 + (4 + 5) = 8 + 9 = 17.$$

Notice that both problems gave us the same answer. When adding three numbers together, it does not matter which two numbers you add together first. Either add the first two or the last two and you will get the same result in the end. This is known as the **Associative Property of Addition**.

Associative Property of Addition

$$(a + b) + c = a + (b + c)$$

Here, the order of the numbers did not change but which two numbers you group or *associate* together changed.

Name the property being used:

Ex. 3a $(11 + 4) + 6 = 11 + (4 + 6)$

Solution:

Associative Property of Addition.

Ex. 3b $8 + 45 = 45 + 8$

Solution:

Commutative Property of Addition.

Ex. 3c $(2 + 8) + 6 = 6 + (2 + 8)$

Solution:

Commutative Property of Addition.

Ex. 3d $(3 + 8) + 7 = 8 + (3 + 7)$

Solution:

Both the Commutative and Associative Properties!

If you add 0 to any number, you get the same number. This is known as the **Addition Property of Zero**.

Addition Property of Zero

$$a + 0 = a \quad \text{and} \quad 0 + a = a$$

Objective b: Adding Whole Numbers.

In adding whole numbers, we can stack the numbers vertically being careful to align the digits according to their place value. Then, we can add the digits in each place value starting with the ones place and moving from right to left. If the sum is 10 or higher, we write the digit in the ones place down and write the digit in the tens place on top of the next column (this is called the “carry”). Here are some key words that imply addition:

the total of 11 and 8	$(11 + 8)$
8 added to 12	$12 + 8$
7 more than 6	$6 + 7$
4 increased by 5	$4 + 5$
the sum of 8 and 3	$(8 + 3)$
15 plus 7	$15 + 7$
13 greater than 9	$9 + 13$
exceeds 5 by 6	$5 + 6$

Perform the Indicated Operation. Check the answer on a calculator:

Ex. 4 The sum of 5316, 1322, and 955.

Solution: **1 1**

5316	$6 + 2 + 5 = 13$, write down the 3, carry the 1
1322	$1 + 1 + 2 + 5 = 9$, write down the 9
<u>+ 955</u>	$3 + 3 + 9 = 15$, write down the 5, carry the 1
7593	$1 + 5 + 1 = 7$, write down the 7

So, 7593 is the answer.

Ex. 5 The total of 32,500, 763,420, and 2,837,667

Solution: **1 1**

132,500	$0 + 0 + 7 = 7$
1 763,420	$2 + 6 = 8$
<u>+ 2,837,667</u>	$5 + 4 + 6 = 15$, carry the 1
3,633,587	$1 + 2 + 3 + 7 = 13$, carry the 1
So, 3,633,587 is	$1 + 3 + 6 + 3 = 13$, carry the 1
the answer.	$1 + 7 + 8 = 16$, carry the 1
	$1 + 2 = 3$

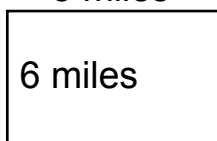
Objective c: Finding the Perimeter.

The **Perimeter** of a two-dimensional object is the sum of the lengths of the sides of the object.

Find the perimeter of the following:

Ex. 6a

8 miles



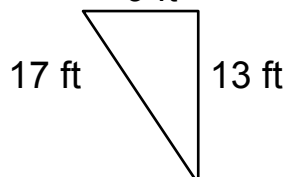
Solution:

$$P = 6 + 8 + 6 + 8$$

$$= 28 \text{ mi}$$

Ex. 6b

9 ft

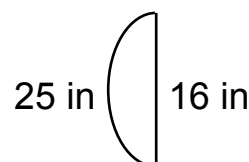


Solution:

$$P = 17 + 9 + 13$$

$$= 39 \text{ ft}$$

Ex. 6c



Solution:

$$P = 25 + 16$$

$$= 41 \text{ in}$$

Use the table below to answer the following questions:

What Charlie had to eat for today

Food	Calories	Total Fat	Sodium
CROISSAN'WICH® w/Sausage, Egg & Cheese	470	31 g	1030 mg
Hash Brown - Medium	610	39 g	980 mg
Coffee (medium)	10	0 g	25 mg
Original DOUBLE WHOPPER® with cheese	1010	66 g	1530 mg
French Fries (large)	580	28 g	990 mg
Coca Cola® (large)	390	0 g	10 mg
Big Mac®	540	29 g	1040 mg
Large French Fries	500	25 g	350 mg
Sprite® (32 fl oz)	310	0 g	80 mg
Source: www.burgerking.com and www.mcdonalds.com			

Ex. 7 Find the total calories, the total fat, and the total sodium that Charlie consumed during the day.

Solution:

Align all the numbers from the calorie column and the sodium column and add:

3	3	34
470	31	1030
610	39	980
3 10	0	25
1010	66	1530
580	28	990
390	0	0
540	29	1040
500	25	350
+ 310	+ 0	+ 80
4420 calories	218 g	6025 mg

By the way, the recommend intake of calories is between 2000 and 2500 calories per day, the intake of fat should be less than 65 grams and the intake of sodium should not exceed 2500 mg per day.