Adding in Easier Way

By Dr. Alice C. Raganas

"Class, can you think of as many addition expressions as possible that can have a sum of 6," asked the teacher, Mr. Planas.

"I got 1 + 5 = 6 in mind, Sir. I have 5 + 1 in mind, too," replied Fely.

Amie raised her hands. "Sir, 0 + 6 = 0 and 6 + 0 = 6."

"You're both right. Are there some more ideas?" asked Mr. Planas.

"I have another one, Sir," responded Susan. "3 + 3 =6, isn't it, Sir?"

"You're right, Susan," replied the teacher.

"Two plus four equals six," said Rogel.

"You're right also, Rogel, and it can also be 4 + 2 = 6," said the teacher.

"Can I use three numbers that will add up to six, Sir?" asked Mariz.

"Sure. As long as the sum is 6," replied the teacher.

"The expressions 1 + 2 + 3 or 3 + 2 + 1 or 2 + 3 + 1 will give a sum of 6," said Mariz. "1 + 3 + 2 or 3 + 1 + 2 or 2 + 1 + 3 is included."

"Very good, Mariz!" said Mr. Planas.

Mr. Planas wrote the answers on the board.

1 + 5	0 + 6	3 + 3	4 + 2	3 + 2 + 1	1 + 3 + 2
5 + 1	6 + 0	2 + 4	1 + 2 + 3	2 + 3 + 1	3 + 1 + 2
					2 + 1 + 3

"How some of these expressions are alike, yet different?" asked the teacher while pointing at the expressions on the board.

"I noticed that some expressions involve the same addends, but in a different order like 4 + 2 and 2 + 4," replied Amie.

"You're right Amie. Do you know that knowing the addition properties can help you add numbers easier?" asked the teacher.

"Can you teach as these addition properties, Sir?" asked Frank.

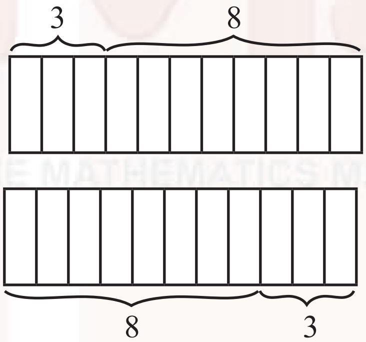
"Sure. Here are the properties of addition that will help you evaluate, or find the value of numerical and algebraic expressions," said the teacher. He presented the properties of addition using PowerPoint.

Properties of Addition

- Commutative Property

  The order in which numbers are added does not affect their sum.

  $3 + 8 = 8 + 3$



$3 + 8 = 11$

$8 + 3 = 11$

All these sums are the same.

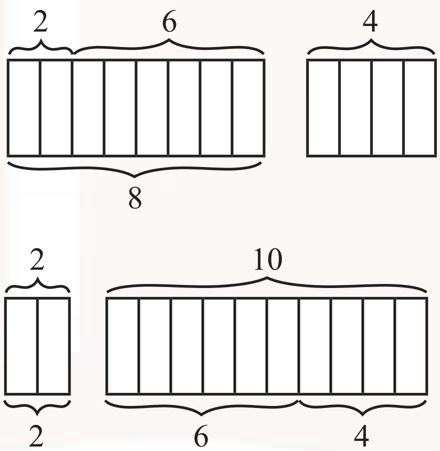
$2 + 3 + 5$	$3 + 2 + 5$	$5 + 2 + 3$
$2 + 5 + 3$	$3 + 5 + 2$	$5 + 3 + 2$

The commutative property allows you to add two or more numbers in any order.

- Associative Property

  The way in which numbers are group does not affect their sum.

  $(2 + 6) + 4 = 2 + (6 + 4)$



$(2 + 6) + 4 = 8 + 4 = 12$

$2 + (6 + 4) = 2 + 10 = 12$

All these sums are the same.

$[(2 + 3) + 4] + 5$

$2 + [3 + (4 + 5)]$

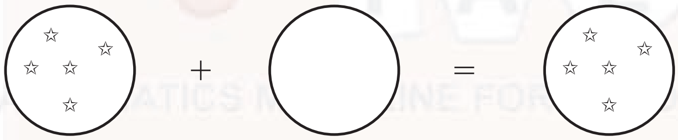
$2 + [(3 + 4) + 5]$

$[2 + (3 + 4)] + 5$

The Associative Property allows you to group three or more numbers in any way to add them.

- Identity Property

  The sum of any number and zero is that number.



5 + 0 = 5

Knowing these addition properties, the students can add two or more number easier.

Try This!

Part 1

Complete the equation and write the property you used.

1. 6 + 3 = ☐ + 6 ______________________
2. (3 + 2) + 5= 3 + (☐ + 5) ______________________
3. 0 + 54 = ☐ ______________________
4. (18 + 3) + 9 = ☐ + (18 + 3) ______________________
5. 3 + 65 + 12 = ☐ + 12 + 3 ______________________
6. 12 + 9 = 9 + ☐ ______________________
7. 7 + (2 + 4) = (7 + 2) + ☐ ______________________
8. 28 + ☐ = 28 ______________________
9. (2 + 6) + 5 = 2 + (☐ + 5) ______________________
10. 0 + 15 = ☐ + 0 ______________________

Evaluate. Identify the property you used.

11. 37 + (36 + 29) ______________________
12. (14 + 25) + 75 ______________________
13. 38 + 14 + 22 ______________________
14. (15 + 15) + 97 ______________________
15. 124 + 0 ______________________
16. 89 + 24 + 76 ______________________
17. 50 + (17 + 20) ______________________
18. 12 + 12 + 15 ______________________
19. 0 + 154 ______________________
20. 19 + (10 + 8) ______________________

Part 2

Solve:

Explain your answer here.

1. Jonathan is solving a problem that uses the expressions 45 + 12 + 12. He begins by adding 12 and 12 instead of adding 45 and 12. Why do you think he begins with this step? What property of addition does his strategy illustrate?

2. Janet thinks that these two expressions are equal. (a + 0) + 5 and a + 5. Is Janet correct? Explain how you know.

3. Use the properties of addition to write expressions that are equal to this expression.
   28 + (3 + 9) + (10 + 28)

4. Explain how the addends 53 + 11 + 4 + 19 + 17 can be rearranged to make numbers easier to add. Then follow your plan, and find the sum.

5. Solve each problem. Group numbers to make them easier to add.

   a. 9 + 13 + 1 + 7 = ? b. 99 + 18 + 1 + 2 = ?

   c. 8 + 9 + 7 + 1 + 3 + 3 + 17 + 12 = ?

Answers:

Part 1

1. 3; commutative property
2. 2; associative property
3. 54; identity property
4. 9; commutative property
5. 65; commutative property
6. 12; commutative property
7. 4; associative property
8. 0; identity property
9. 6; associative property
10. 15; identity property

11. 102; associative property
12. 114; associative property
13. 74; commutative property
14. 127; associative property
15. 124; identity property
16. 189; commutative property
17. 87; associative property
18. 39; commutative property
19. 154; identity property
20. 37; associative property

Part 2

1. He added 12 and 12 because they have easier sum to find using mental math. His strategy illustrates the commutative property.
2. Yes. The identity property shows that a + 0 equals a and the commutative property shows that a + 0 + 5 = a + 5.
3. Possible answers:
   28 + 3 + 9 + 10 + 28
   (28 + 3) + 9 + (10 + 28)
   (28 + 3) + (9 + 10) + 28
   28 + 3 + 9 + (10 + 28)
4. 53 + 11 + 4 + 19 + 17 =
   (53 + 7) + (11 + 19) + 4 =
   The sum is 94.
5.
   a. 10 + 20 = 30
   b. 100 + 20 = 120
   c. 20 + 20 + 10 + 10 = 60