Math 2 Classwork 12

Test Review

1

Solve for x:

$x + 6 = 89$ $87 - x = 37$

2

Use the properties of addition to rewrite each addition fact (to make the calculation easier):

$(66 + 48) + 34 =$ $(36 + 81) + 19 =$

$82 + 36 - 12 =$ $77 - 18 + 23 =$

3

a) One side of a triangle is 3m 4dm 8cm, the second side is 2 dm, and the third side is 4m 2cm. What is the perimeter of the triangle in centimeters?

P =_____

b) A rectangle is 1m 25cm long and 3dm 5cm wide. What is the perimeter of the rectangle in centimeters?

P =_____

4.

Write down the expressions and find their values:

a) subtract 39 from the sum of 47 and 18 _____

b) add 29 to the difference between 80 and 27 _____

Homework Review

1. Find the perimeter:

a) The length of a rectangle is 37 cm, and its height is 14 cm. Calculate the perimeter of the rectangle. P = _____

b) The length of a rectangle is 37 cm, which is 14 cm more than its height. Calculate the perimeter of the rectangle. P = _____

2. A polygonal chain has 3 segments. The length of the first segment is 5 cm, the length of the second segment is 1cm shorter, than the length of the first one and the length of the 3rd segment equals the sum of the 1st and 2nd segments. Finds the total length of the polygonal chain. Draw this chain.

New Material

Commutative and Associative properties of addition.

Commutative property: When two numbers are added, the sum is always the same regardless of the order of the addends. For example: $3 + 5 = 5 + 3$

Associative property: When three or more numbers are added, the sum is always the same regardless of grouping of the addends. For example: $(3 + 5) + 1 = 3 + (5 + 1)$

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Calculate using the most convenient (simplest) way. Which properties of addition will you use?

Example: $18 + 64 + 12 + 6 = (18 + 12) + (64 + 6) = 30 + 70 = 100$

$22 + 13 + 78 + 17 =$ _____

$137 + 40 + 113 + 60 =$ _____

$236 + 83 + 17 + 44 + 20 =$ _____

Properties of Addition. Order of Operations.

$$a + b = b + a$$

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

6 a) Perform the actions in the following order:

- Subtract number 3 from the number 8

- To the result, add the number 4

_____

b) Perform the actions in this order:

- Increase number 3 by 4

- Subtract the result from the number 8

_____

What did you notice?

Why do we need parentheses?

When we have a math problem that involves more than one operation—for example, addition and subtraction, or subtraction and multiplication—which operation do you perform first?

Example: $8 - 4 + 1$

If the operations are performed in the natural order:

1st - subtraction , then - addition, the answer will be 5.

In order to change the natural order, we use *parentheses*. By inserting parentheses around the particular operation, we are saying that this particular operation should be performed first.

$$\overset{①\;②}{8 - 4 + 1} = 5 \qquad\qquad \overset{②\;①}{8 - (4 + 1)} = 3$$

If there are several pairs of parentheses in the expression, we perform operations inside them from the left to right.

$$\overset{①\quad③\;④\quad②}{Example:\ (5 + 1) - 4 + (8 - 5)}$$

How do we work with parentheses?
The part between two parentheses is treated like a SINGLE number.

Removing parentheses.
$$a + (b + c) = a + b + c$$
$$a + (b - c) = a + b - c$$
$$a - (b - c) = a - b + c$$

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Find the values of the expressions for **a** = 30; **b** = 12; **c** = 3. What did you notice?

$(a - b) + c =$ _____

$a - (b + c) =$ _____

8

Number the order of operations in the way that they should be performed.

ⓐ ② ①

a) $26 + (32 - 16)$ e) $a + b - c + d$

b) $(247 - 123) + (384 - 164)$ f) $(a + b) - (c + d)$

c) $93 + (12 + 16) - 35$ g) $a + (b - c) + d$

d) $(72 + 13) - 47 - (94 - 76)$ h) $a + (b - c + d)$

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Place parentheses where necessary to make sure the order of operations is as shown:

①② $a + b + c$ ①② $a - b + c$ ①② $a + b - c$ ①② $a - b - c$

②① $a + b + c$ ②① $a - b + c$ ②① $a + b - c$ ②① $a - b - c$

REVIEW

Complete the tables:

10 a)

Brian's age	5	11	23	35		66
Olivia's age	13	19	31		52	

Q1: Brian is 16. How old is Olivia? _____   **Q2**: Olivia is 47. How old is Brian?

b)

Elli's pushups	3		10	13		
Elli's sit-up's	15	19	22	25	28	60

Q1: Elli does 27 pushups. How many sit-ups does he do? _____

Q2: Elli does 50 sit-ups. How many pushups does he do? _____

11 **Compare, using <, > or =:**

9dm – 2dm 3cm ____ 7dm 7cm   71cm – 10cm _____ 6dm 1cm

9dm + 10cm ____ 1m   39dm + 61dm _____ 100cm

Did you know …

Origins of Parentheses

The symbols themselves first showed up in the late 14th century, with scribes using *virgulae convexae* (also called *half-moons*) for a variety of purposes. By the end of the 16th century, the *parentheses* (from the Latin "insert beside") had begun to assume their modern role. Early occurrence of parentheses in math are found in the manuscript edition of R. Bombelli's Algebra (about 1550).

Leonard Euler contributed vastly toward accustoming mathematicians to use parentheses. Euler was one of the most eminent mathematicians of the 18th century and is held to be one of the greatest in history. He is also widely considered to be the most prolific mathematician of all time. He wrote more than 500 books and papers during his lifetime, more than anybody in the field. He spent most of his adult life in St. Petersburg, Russia, and in Berlin, then the capital of Prussia.

Leonhard Euler
(1707-1783)

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