Math 3, Classwork 14

WARM-UP

1. Multiplication Gym – 3 minutes

2. Rewrite in descending order (from greatest to least):

10dm, 25cm, 1m2cm, 2dm2cm, 10dm5cm, 2m, 70dm

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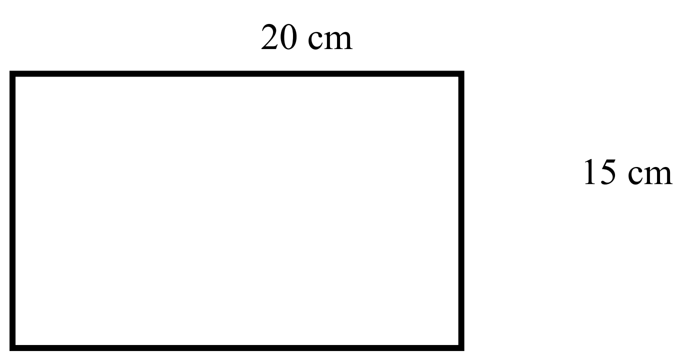
3. Calculate (remember about the order of operations)

$4 \times 5 + 5 \times 6 =$ $\qquad$ $70 - 2 \times 8 - 24 \div 6 =$

$46 + 11 \times 4 - 30 \div 5 =$ $\qquad$ $36 \div 12 + 48 \div 12 =$

Homework REVIEW

4. Use the rectangular piece of paper such as its length equal 20 cm and it's width equal 15 cm. Out of this rectangle cut out the largest possible square. From the remaining rectangular part cut out another largest possible square. What are the areas of the two squares and what is the area of the remaining piece of the paper?



5. Calculate by most optimal way. (Hint: use a commutative property of addition)

$$(200 + 198 + 196 + \ldots + 2) - (1 + 3 + 5 + \ldots + 199)$$

6. a) ***x*** brown ducks and ***y*** gray ducks are digging the warms. All ducks were divided into several teams with 5 ducks in each team. How many different teams can be organized? ______________________________

b) One squirrel has ***a*** acorns. A second squirrel has twice as many acorns as the first one. They decided to hide their acorns in two different places. How many acorns are going to be hide in each place? ________________________________

c) Caterpillar had traveled ***b*** meters and this is ***c*** meters less than Snail. How many meters did they travel together? _____________________________________

NEW MATERIAL I

Division by zero.

Division is a reverse operation for multiplication.

$$A \div B = C \text{ means that } C \times B = A$$

$A \div 0$ has no meaning, as there is no number, which, multiplied by **0**, gives A (assuming $A \neq 0$), and so **division** by zero is **undefined**.

$$C \times 0 = 0 \text{ and never } = A!$$

Dividing by zero is not allowed! ~~$a : 0$~~

7. Solve the following word problems:

a) One side of a rectangle is 5 dm. What is its other side if the area of the rectangle is 30 dm^2? ________________________________ [30 dm^2]

b) One side of a rectangle is ***a*** cm. Another side is 4 cm. What is the area of the rectangle? ________________________________ [_____ cm^2]

c) The area of a rectangle is 24 m^2. What is the width of the rectangle if its length is 8 m? [24 m^2]

8. Use the rectangles to visualize the equations and to solve them:

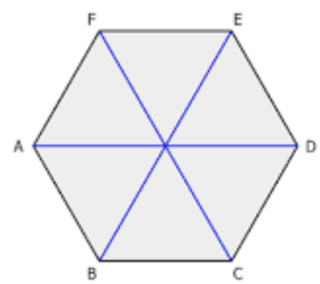
6

30 x

$x \times 6 = 30$	$42 \div y = 7$	$9 \times z = 72$	$t \div 6 = 8$
$x =$ _____	$y =$ _____	$z =$ _____	$t =$ _____
$x =$ _____	$y =$ _____	$z =$ _____	$t =$ _____
$x =$ _____	$y =$ _____	$z =$ _____	$t =$ _____

REVIEW

Lets build a symmetrical hexagon inside the circle using a compass and a straight edge only



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Using your symmetrical hexagon, find all triangles, which sides do NOT go through the center of the circle. How many such triangles are there? Name them correctly. What kind of triangles are they? ________________________________

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NEW MATERIAL II

A **set** is simply a collection of things, or objects. Here are some examples:

- Set of all digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9
- Set of days of the week.
- Set of all months.

A set may be defined by a common property amongst the objects. For example, the set E of positive even integers is the set E={2,4,6,8,10…}.

There is a fairly simple **notation** for sets. We simply list each element (or "member") separated by a comma, and then put some curly brackets around the whole thing:

{1, 2, 3, …}. 1, 2 and 3 are "elements" or "members" of the set, three dots means that it goes on forever. This set is infinite. Not all sets are **infinite**.

For example, **{a, b, c, ..., x, y, z}** In this case it is a **finite set** (there are only 26 letters, right?)

When talking about sets, it is fairly standard to use Capital Letters to represent the set, and lowercase letters to represent an element in that set. For example, A is a set, and ***a*** is an element in A. A= {a}.

9. Name the set that the following elements belong to. Then name another element that belongs to the set. Ex. A rose, a tulip, a sunflower. Is a set of: flowers. Another element of the set is: a lily.

a) A student, a baby, a teacher, a grandfather. Is a set of: __________________. Another element of the set is: __________________.
b) Math, Science, English. Is a set of: __________________. Another element of the set is: ____________________.
c) A penny, a quarter, a nickel. Is a set of: __________________. Another element of the set is: __________________.
d) A cucumber, a pepper, an onion. Is a set of: __________________. Another element of the set is: ____________________.
e) Come up with your own example of a set and its elements. A set of: __________________. The elements of the set are: ________________________

____.

We illustrate relationship between various sets by using **Venn diagrams**: we draw all objects as points on the plane, and then we draw a loop (or some other shape) around all objects of a particular set. Different loops correspond to different sets.

10. Let us sort those shapes out into different groups (sets).

a) Name different properties that can be used to sort the following shapes: ___

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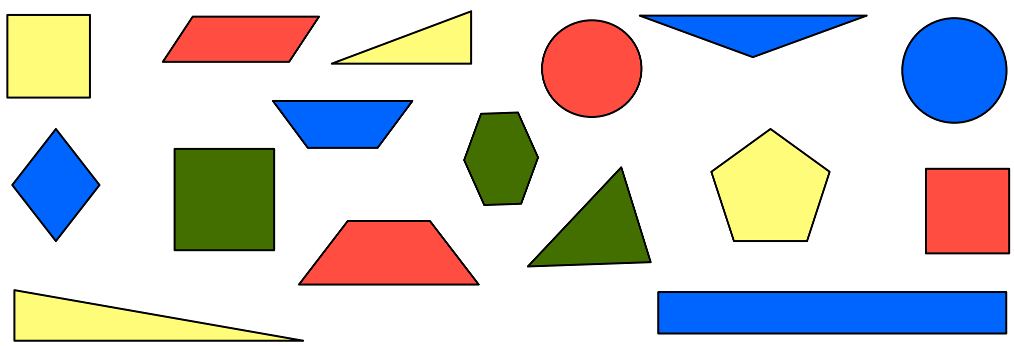
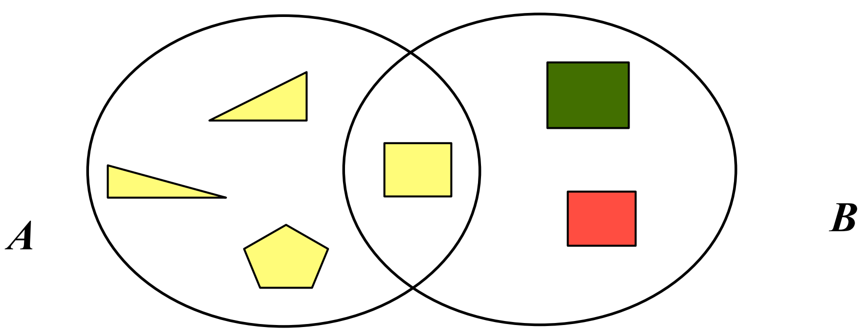
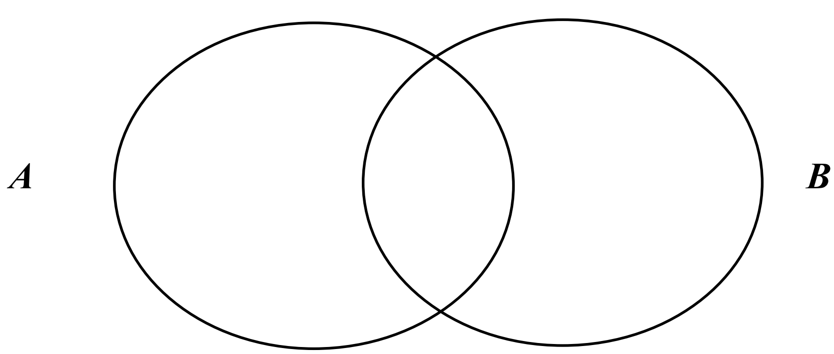


b) Look at the drawing below. All yellow shapes are in the set ***A;*** all squares are in the set ***B.*** Yellow squares form a set that belongs to the intersection of sets ***A*** and ***B***.

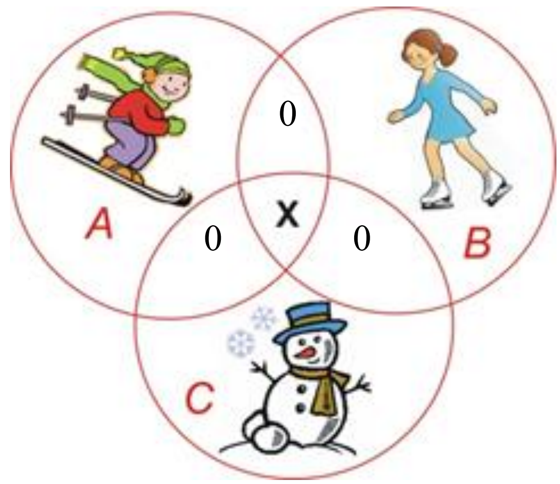


c) In circle ***A*** place all red shapes (draw those shapes using red pencil)

In circle ***B*** place all circles. What shapes will be in the overlap of two sets ***A*** and ***B***?



11. There are 24 students in the class. They all have had a wonderful winter break and participated in various activities. 10 of them went skiing, 16 went skating and 12 were making a snowman. None of the students were involved in 2 activities. How many students could do all 3 activities?



Did you know …

John Venn (4 August 1834 – 4 April 1923), was a British logician and philosopher.

John Venn came up with Venn Diagrams in 1880, while working in the famous University of Cambridge. Venn's main area of interest was logic, and it was in this field that he made his most important contribution. This was the introduction of Venn diagrams (that is, overlapping circles used to represent properties of sets and subsets) in his book "Symbolic Logic" in 1881. Venn was not the first person to use these diagrams, they had been used by others before him such as Gottfried Leibniz in the 17th century. Venn did, however, make important contributions and additions to it and his efforts led them to be standardized and widely used in academia and research.

Venn also had a rare skill in building machines. He used his skill to build a machine for bowling cricket balls, which was so good that when the Australian Cricket team visited Cambridge in 1909, Venn's machine clean bowled one of its top stars four times.

With his son he wrote a two-volume history of Cambridge, and complied an extensive database of biographical information on some 136,000 Cambridge graduates and staff, from "the earliest times" to the dawn of the 20th century.