Accelerated Math. Class work 1.

Algebra.

1. Can you compare

$$9+19+9+39+47+69 \qquad 200$$

2. Compute by the most convenient way:

a) $(179+94)+21=$

b) $(356+849)+(51+644)=$

c) $99+99+99+99+99+99+99+99+8=$

d) $2005+768+32+995+19=$

e) $2\cdot5\cdot2\cdot5\cdot7\cdot2\cdot5=$

f) $24\cdot128+76\cdot128=$

g) $2\cdot4\cdot25\cdot5\cdot3=$

3. Can you compare 2 fractions:

$$\frac{3}{5}\quad\frac{7}{5}, \qquad\qquad \frac{7}{15}\quad\frac{7}{16}, \qquad\qquad \frac{48}{49}\quad\frac{49}{50}$$

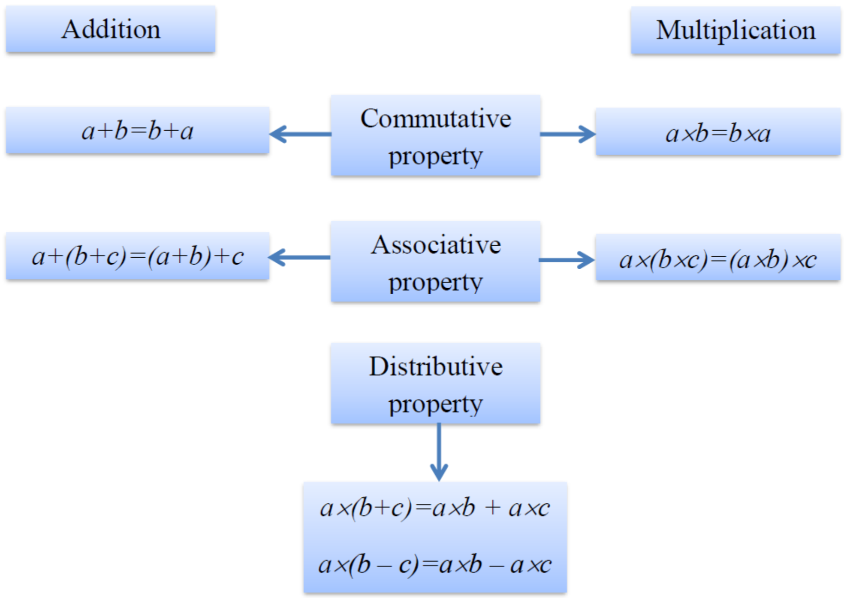
4. In the school cafeteria, there are 12 tables. There are 10 seats at each table. At the lunch time $\frac{4}{5}$ of all sits were occupied by students. How many students were in the cafeteria?

5. An apple worm was eating an apple. On the first day it ate half of the apple, on the second day it ate half of the rest, and on the third day it ate half of the rest again. On the fours day it ate all the leftovers. What part of the apple did it eat on the fourth day?

6. Write the expression for the following problems:

a. 3 packages of cookies cost a dollars. How many dollars do 5 of the same packages cost?

b. 5 bottles of juice cost b dollars. How many bottles can one buy with c dollars?

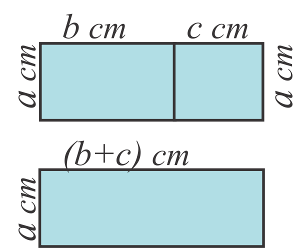


$$a + 0 = a$$

$$a \cdot 1 = a$$

Farmer put green and red grapes into boxes. Each box contains 5lb of grapes. How many pounds of green and red grapes altogether did farmer put into boxes if he had 10 boxes of green and 8 boxes of red grapes? Is there any difference between these 2 expressions:

$$5 \times (10 + 8) \quad or \quad 5 \times 10 + 5 \times 8$$



Let's consider this in another example: The combined area of these 2 rectangles is $S = a \times b + a \times c$ but the rectangle with one side a cm and the other (b+c) cm will have exactly the same area.

7. Compute by the most convenient way:

$23 \times 15 + 15 \times 77 =$

$79 \times 21 - 69 \times 21 =$

$340 \times 7 + 16 \times 70 =$

$250 \times 61 - 25 \times 390 =$

$67 \times 58 + 33 \times 58 =$

$55 \times 682 - 45 \times 682 =$

Word problems.

Read the following "word problems". What can you tell about each of them? Try to solve them.

a) Jessica is older than Sam, Ann is older than Jessica, and Robert's age is same as Sam's. Who is the oldest?

b) Mike has 25 cards; John has 5 cards more than Mike. How many cards do John, Mike and Robert have altogether?

c) On a farm there were 6 cows and 20 sheep. Each cow gives 4 gallons of milk every day. How many farm animals were there on the farm?

d) In a math class 10 students were solving problems. Each student solved exactly 5 problems. How many students did solve 7 problems?

e) In a math class 10 students were solving problems. Each student solved at least 5 problems. How many students did solve 7 problems?

f) Two circles touch at a single point (tangent circles). One has radius of10 cm and the other has radius of 6 cm. What is the distance between the centers of these circles?

8. An adult elephant weighs 10833 pounds more than a baby elephant. Together they weigh 32037 pounds. How many pounds does a baby elephant weight?

Geometry.

A **definition** is a statement of the meaning of a something (term, word, another statement).

desk
noun
noun: **desk**; plural noun: **desks**

1. a piece of furniture with a flat or sloped surface and typically with drawers, at which one can read, write, or do other work.

- Music
  a position in an orchestra at which two players share a music stand.
  "an extra desk of first and second violins"

- a counter in a hotel, bank, or airport at which a customer may check in or obtain information.
  "the reception desk"

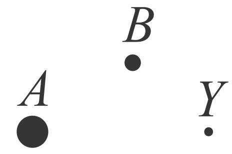
In mathematics everything (mmm,,,, almost everything) should be very well defined. In our real life, it is also very useful and convenient to agree about terms and concepts, to give them a definition, before starting using them just to be sure that everybody knows what they are talking about.   Now we move to geometry.

Can we give a definition to a point? Can we clearly define what a point is? What a line is? What a plane is?

Mathematicians decided do not define terms "point", "straight line", and "plane" and to rely upon intuitive understanding of these terms.

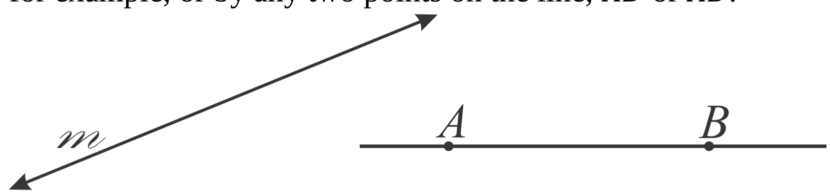
Point (an undefined term).

In geometry, a point has no dimension (actual size), point is an exact location in space. Although we represent a point with a dot, the point has no length, width, or thickness. Our dot can be very tiny or very large and it still represents a point. A point is usually named with a capital letter.



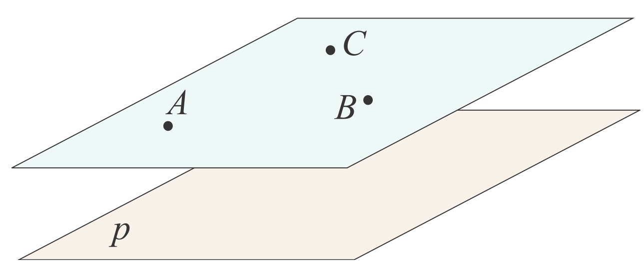
Line (an undefined term).

In geometry, a line has no thickness but its length extends in one dimension and goes on forever in both directions. Unless otherwise stated a line is drawn as a straight line with two arrowheads indicating that the line extends without end in both directions (or without them). A line is named by a single lowercase letter, m for example, or by any two points on the line, $\overleftrightarrow{AB}$ or AB.



Plane (an undefined term).

In geometry, a plane has no thickness but extends indefinitely in all directions. Planes are usually represented by a shape that looks like a parallelogram. Even though the diagram of a plane has edges, you must remember that the plane has no boundaries. A plane is named by a single letter (plane p) or by three non-collinear points (plane ABC).



A line segment is a part of a straight line between two chosen points.
(A set of points of a straight line between two points.)
These points are called endpoints.

A ray is a part of a straight line consisting of a point (endpoint) and all points of a straight line at one side of an endpoint. Ray is named by endpoint and any other point, ray $\overrightarrow{AB}$ or *AB* (where *A* is an endpoint)

Exercises:

1. Draw two line segments AB and CD in such way that their intersect
   a. by a point
   b. by a segment
   c. don’t intersect at all.

2. Using a ruler draw a straight line, put on it 3 points, *A*, *B*, and *C* so that 2 rays are formed, *BC* and *BA*.

3. Draw two rays AB and CD in such way that their intersect
   d. by a point
   e. by a segment
   f. by a ray
   g. don’t intersect at all

4. On the segment *AB* mark a point *M*. How many segments do we have on the picture? Mark another point *P*. How many segments do we have now? Mark a third point *F*. Count segments. How many segments will be if you mark 5 points? 10 points? 99 points?