WARM-UP

1 Mental math. Find a value of each expression.

$200 + 300 + 100 =$ $900 - 500 - 300 =$
$800 - 600 + 200 =$ $700 - 100 + 200 =$
$500 + 100 - 400 =$ $600 + 300 - 900 =$

2 State which equality below is TRUE (mark with T) and which one is FALSE (mark with F):

$2 + 5 = 6$ ___ $12 = 10 + 2$ ___
$3 + 5 = 2 + 5$ ___ $3 + 2 = 2 + 3$ ___
$4 + 4 = 8$ ___ $32 = 23$ ___
$3 + 4 + 2 = 4 + 5$ ___ $5 + 3 = 8 + 1$ ___

3 Find the difference between two numbers:
   a) 346 and 16 _____
   b) 275 and 273 _____
   c) 627 and 36 _____

Homework Review

1. Two small boxes have the same amount of balls. One big box has as many balls as the other two together. Write an equation to show how many balls are in the big box.

L balls   L balls   X balls

_____

_____

2. Share the patterns you made yourself using buttons (or other objects) at home with a class.

Two - ways tables.

Two-way table shows data that belong to two different categories.

4 Use two-ways table to solve a problem.

Each of the three boys named Peter, Aaron, and Alex owns one of the three dogs on the picture: a collie a hound, and a spaniel. Write the name of each owner under the picture of his dog if Peter does not own the hound, and Peter and Alex do not own the spaniel.

5 Emma collected information about the cats and dogs' owners in her class. She filled in the table below but missed out one number.

	Has a dog	Does not have a dog
Has a cat	8	4
Does not have a cat	12	

1. Explain how to find the missing number if there are 30 children in Emma's class.

2. How many children own at least one of these pets?

3. Do more children own cats rather than dogs?

4. Could it be true that some of the children do not have any pets (cat or dog)?

REVIEW

6

Look at the definitions below and connect each definition with a correct term.

• it's in a straight path.   **Ray**
• goes in both directions.
• does not end ... so you can't measure its length

• it's straight.   **Line Segment**
• is part of a line.
• has one endpoint.
• goes in ONE direction.

• is straight.   **Line**
• is a part of a line.
• has 2 endpoints that show the points that end the line.

Intersection of Lines.

Two lines in the same plane will always intersect unless they are parallel.
The **intersecting lines** share a common point, which is called the **point of intersection**.
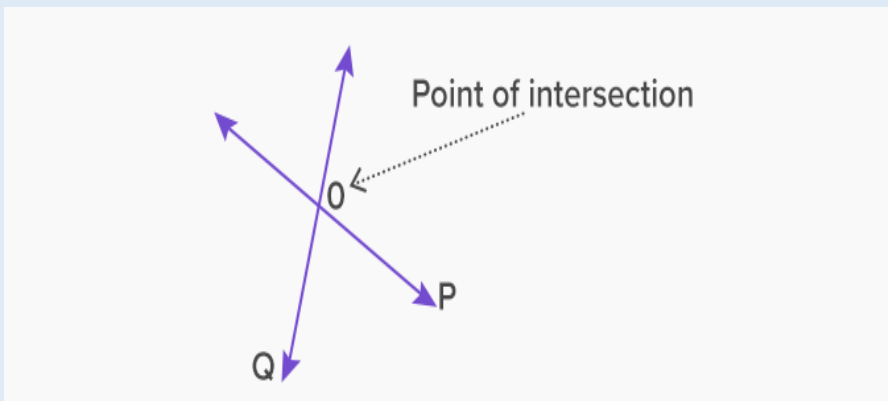
Parallel lines are lines that are always the same distance apart and they never intersect.
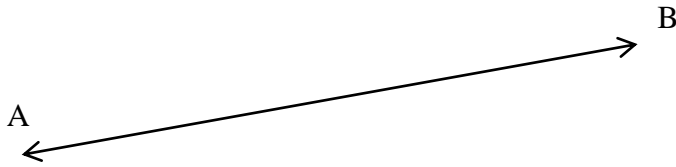In the real world a good example of parallel lines is a railroad.

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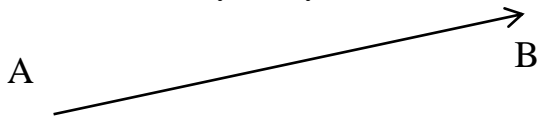Think of examples of intersecting lines in real life.
1.
2.
3.

8 a) This line is called $\overleftrightarrow{AB}$. It can also be called $\overleftrightarrow{BA}$. Line $\overleftrightarrow{BA}$ is the same as line $\overleftrightarrow{AB}$. Arrows show that a line should be continued indefinitely.

B

A

b) This is a ray $\overrightarrow{AB}$. A ray is a part of a line, which starts at a point and goes off in a particular direction to infinity. Is ray $\overrightarrow{AB}$ the same as ray $\overrightarrow{BA}$?

B

A

c) Does a line have length? What about a ray? Can you give an example of geometric object, which has a length?

9 Using your ruler draw:
a) Two **line segments**, which intersect at point K.

b) Two line segments, which do NOT intersect and are not parallel.

c) Two line segments, which are parallel.

10 Consider a pair of rays $\overrightarrow{AB}$ and $\overrightarrow{CD}$. Using your ruler draw:
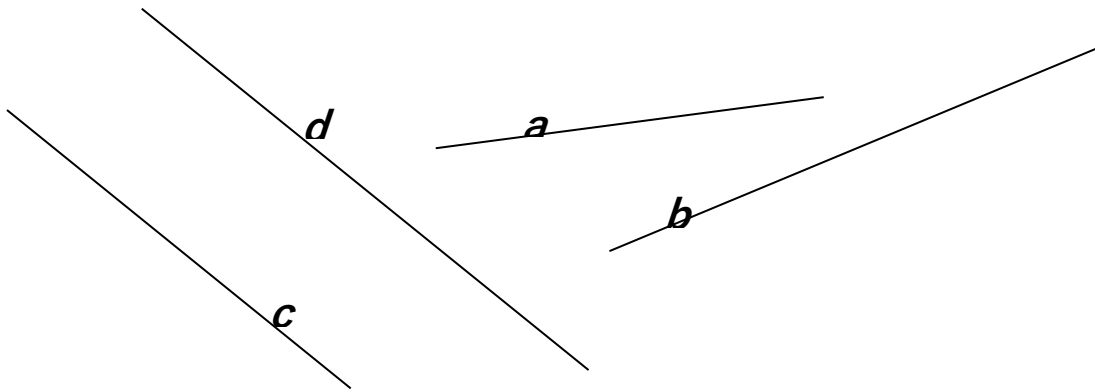a) Two rays which intersect at point M

b) Two rays which do NOT intersect and are not parallel)

c) Two rays which are parallel

11

a) Using a ruler, extend lines **a** and **b**. Find their intersection points with other lines and label those points by any capital letters you choose. Which lines are parallel to each other?


12

The students in Ms. Svetlana's class were drawing geometric shapes. First, she asked them to draw some points, and then she asked them to draw all the line segments they could that connect every pair of the points.

    a) Steven drew 4 points and then drew 4 line segments between them:
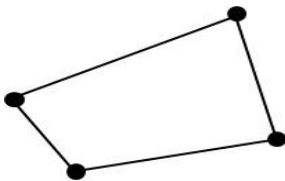
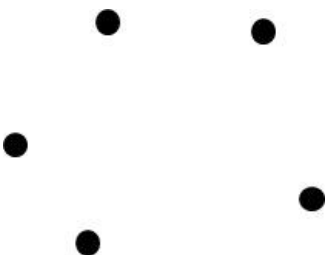**Q:** Are there other line segments that Steven could have drawn? Help Steven.

b) Jonathan drew 3 points and then drew 3 line segments between them:
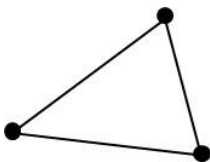
Q: Are there other line segments that Jonathan could have drawn?

c) Here are 5 points. Draw all the line segments you can, connect each pairs of points.

    Q: How many line segments can you draw?

d) There are two points. How many lines can you draw between 2 points? Look, how Tony did that. What do you think of Tony's idea?

Q: Write down the sequence of the number of segments which are connecting 2, 3, 4 and 5 points.

_____

Q: Can you tell how many segments will you need to draw to connect each pair of points if you have 6 points?
Draw a picture to check your answer.

Did you Know …?

Any of our senses can directly observe patterns. Patterns are found everywhere – in the nature, in human–made designs, in architecture, in history, in music and literature, in structure of elements and universe.
By studying patterns in math, humans become aware of patterns in our world.

Observing patterns allows individuals to develop their ability to predict future behavior of natural organisms and phenomena. Civil engineers can use their observations of traffic patterns to construct safer cities. Meteorologists use patterns to predict thunderstorms, tornadoes, and hurricanes. Seismologists use patterns to forecast earthquakes and landslides.

Mathematics is the study of patterns. Studying pattern is an opportunity to observe, hypothesize, experiment, discover and create. By understanding regularities based on the data we gather we can predict what comes next, estimate if the same pattern will occur when variables are altered and begin to extend the pattern.

Pythagoras is credited with being the "Father of Mathematics".

He is also credited as being the "Father of Geometry" as well as the "Father of Music". One of his MOST IMPORTANT DISCOVERIES was that harmonic musical intervals could be expressed by perfect numerical ratios, a finding that led him to the realization that all sensible phenomena follow the pattern of number.

Mathematics is almost entirely motivated by trying to discover or explain patterns. Applied math is concerned with patterns in the "real world". Pure math focuses on patterns in mathematics. Sometimes, but hardly always, mathematical patterns help in understanding patterns in the "real world".
For human behavior, the study of patterns is part psychology, part philosophy and religion.
For the world in general, it's the laws of nature.