**Geometry Sect. 1-4: Segments, Rays, Parallel Lines and Planes Date: \_\_\_**

**Objective 1: I can find the length of segments by using the segment addition postulate.**

* Many geometric figures, such as squares and angles are formed by parts of lines called \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_. A \_\_\_\_\_\_\_\_\_\_ is the part of a line consisting of two endpoints and all endpoints in between them.
* A \_\_\_\_\_\_\_\_\_\_ is the part of a line consisting of one endpoint and all the endpoints of the line on one side of the endpoint.
* \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ are two collinear rays with the same endpoint. \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ always form a line.

Two segments with the same length are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In other words, if AB = CD, then we can write \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. You can use these statements interchangeably. The symbol for congruent is \_\_\_\_\_\_\_\_\_\_. An example is below.



As shown above, segments can be marked with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to show they are congruent.

*\*When you are referring to the actual segment, as a shape, then put the symbol over the letters.*

*\*When you are referring to the segment’s length, we tend not to use the symbol over the letters.*

**Example 1:** Use the number line for parts A – D.



A) Find AB and BC. Are  and  congruent?

B) Compare CD and DE. Are the segments congruent?

C) What is the length of ?

D) Which segment is the shortest? \_\_\_\_\_ Which segment is the longest? \_\_\_\_\_

A **postulate** (also sometimes called an axiom) is a statement that is agreed by everyone to be correct. This is useful for creating proofs in mathematics and science, and **postulates** are often the basic truth of a much larger theory or law. We will see many postulates throughout Geometry.

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| **SEGMENT ADDITION POSTULATE:**ABCIf B is between A and C, then . If , then B is between A and C. |

**Example 2:** Write an equation using the segment addition postulate for each diagram.

A) B)

 

**Example 3:** Draw a segment for the equation: PQ + QR = PR

**Example 4:** Fill in the missing segment: XY + \_\_\_\_\_ = XZ

**Example 5:** Find the value of x, and each indicated length.

A) If DT = 60, find the value of x. B) EG = 100. Find the value of x.

Then find DS and DT. Then find EF and FG.





**Objective 2: I can use a midpoint to find the length of a segment.**

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a segment is a point that divides the segment into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A midpoint, or any line, ray, or other segment through a midpoint, is said to \_\_\_\_\_\_\_\_\_\_\_\_\_ the segment. Let’s draw a segment with its midpoint and label it below.

What equations could you write? 1)

 2)

**Example 6:** Find the value of x, and each indicated length.

A) C is the midpoint of. Find AC, CB and AB.



B) Z is the midpoint of  and XY = 26. Find XZ and ZY.



C) Use the diagram at the right for parts *i – iii.*

*i)* Is M a midpoint of ? Why or why not?

*ii)*  If AB = 16 inches, how long is  and 

iii) If *AM = 2x + 1*, *MB = 4x - 5* and *AB = 8x - 10*, find each length.

*x = \_\_\_\_\_*

*AM = \_\_\_\_\_*

*MB = \_\_\_\_\_*

*AB =\_\_\_\_\_*