Geometry Regents Lomac 2015-2016	Date 1/7	due 1/8	Similarity: Comparing Ratio and Parallel Methods	5.4R

Name _____ **Per**_____

LO: I can show how the parallel method and ratio method lead to one another and to the side splitter theorem. I can use and explain the side splitter theorem.

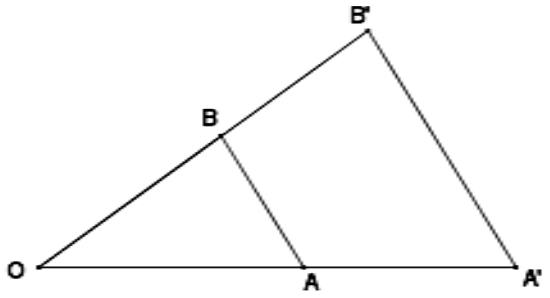
☐ **DO NOW** On the back of this packet

☐ (1) ruler and setsquare **Side Splitter Theorem**

☐ (a) Read the statement of the side splitter and use the diagram to make sense of it. Complete the steps below to help you.

Restatement of the triangle side splitter theorem:

In $\triangle OA'B'$, $\overline{AB}$ *splits the sides proportionally (i.e.,* $\frac{OA'}{OA} = \frac{OB'}{OB}$*) if and only if* $\overline{A'B'} \parallel \overline{AB}$.

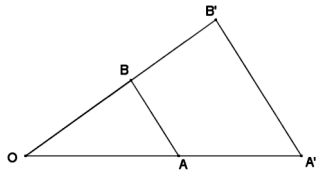


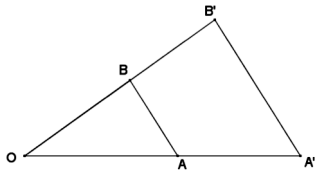
☐ (b) Trace the "side splitter" in the diagram above with a highlighter. (Hint, which segment "splits" or divides sides of a triangle into smaller segments?)

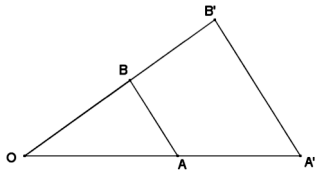
☐ (c) The side splitter (segment _____) is parallel to segment _____.

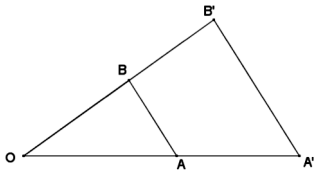
☐ (d) Because a side splitter results in a scale drawing: $\frac{OA'}{OA}$ = _____ = _____

☐ (e) Because a side splitter results in a scale drawing, we can write several proportions:









☐ (2) Side Splitter Theorem

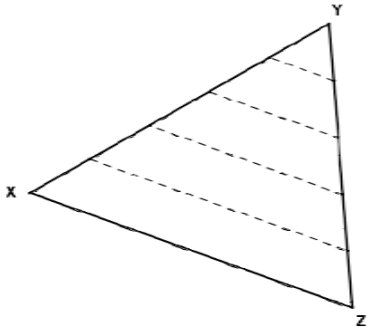
highlighter

Lesson Summary

THE TRIANGLE SIDE SPLITTER THEOREM: A line segment splits two sides of a triangle proportionally if and only if it is parallel to the third side.

☐ (3) Side Splitter Theorem: using it to answer questions and solve problems

Given $\triangle XYZ$, $\overline{XY}$ and $\overline{YZ}$ are partitioned into equal length segments by the endpoints of the dashed segments as shown. What can be concluded about the diagram?



☐ (4) Side Splitter Theorem: using it to answer questions and solve problems

ruler

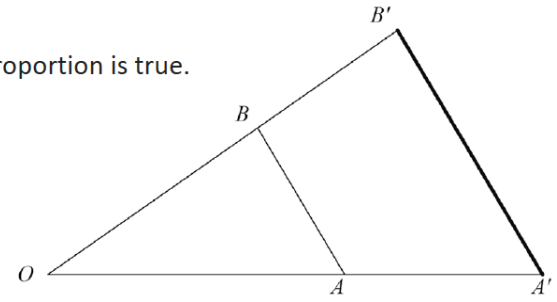
Use the diagram to answer each part below.

a. Measure the segments in the figure below to verify that the proportion is true.

$$\frac{OA'}{OA} = \frac{OB'}{OB}$$

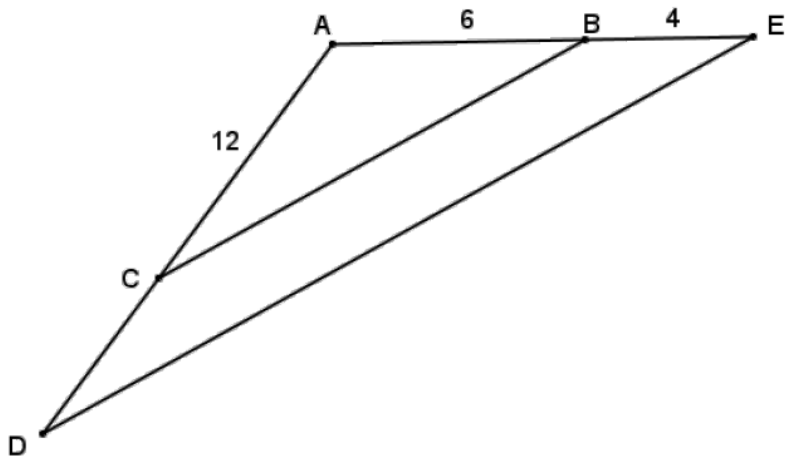
b. Is the proportion $\frac{OA}{OA'} = \frac{OB}{OB'}$ also true? Explain algebraically.

c. Is the proportion $\frac{AA'}{OA'} = \frac{BB'}{OB'}$ also true? Explain algebraically.



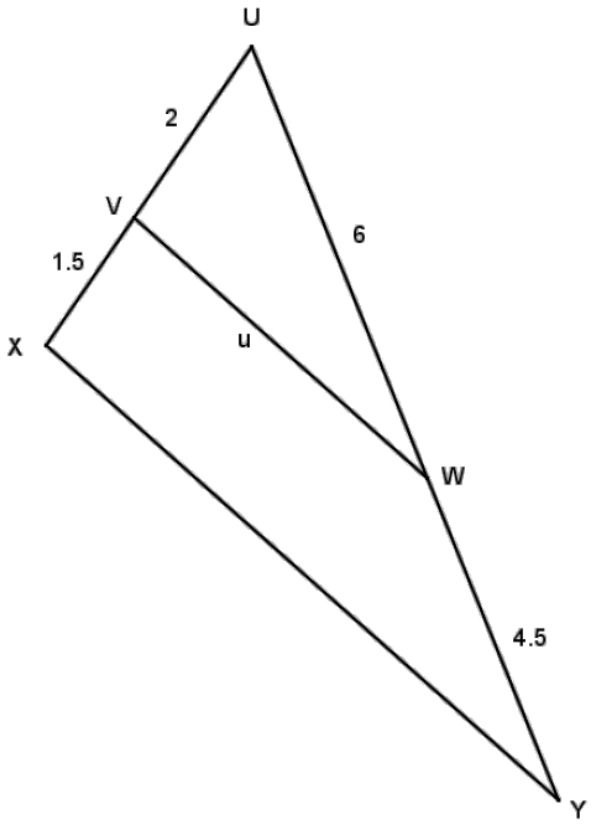
☐ (5) **Side Splitter Theorem: using it to answer questions and solve problems**

Given the diagram, $AC = 12$, $AB = 6$, $BE = 4$, $\angle ACB = x°$, and $\angle D = x°$, find CD.



☐ (6) **Side Splitter Theorem: using it to answer questions and solve problems**

What conclusions can be drawn from the diagram shown to the right? Explain.



☐ (7) **Exit Ticket**

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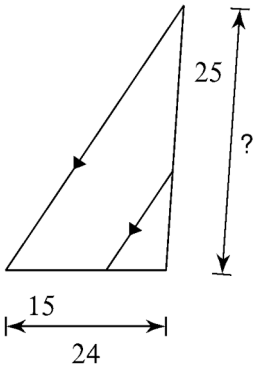
☐ (8) **Homework:**

compass, straightedge

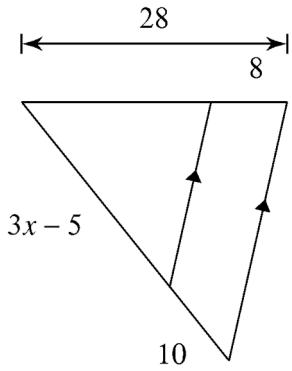
☐ (1) Find the measure of the segment with the question mark.



☐ (8) compass, straightedge

Homework:

☐ (2) Find the value of x.

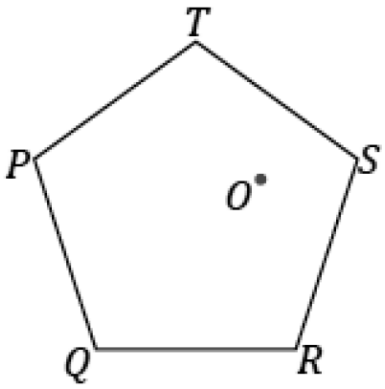


☐ (3) Construct a 30° angle. Try on your own first, then see the hint at the bottom of the page.

(Hint: construct an equilateral triangle and bisect an angle.)

☐ (8) compass, straightedge **Homework:**

☐ (a) With a ruler and setsquare, use the parallel method to create a scale drawing of pentagon $PQRST$ about center O with scale factor $\frac{5}{2}$. Verify that the resulting figure is in fact a scale drawing by showing that corresponding side lengths are in constant proportion and that corresponding angles are equal in measurement.

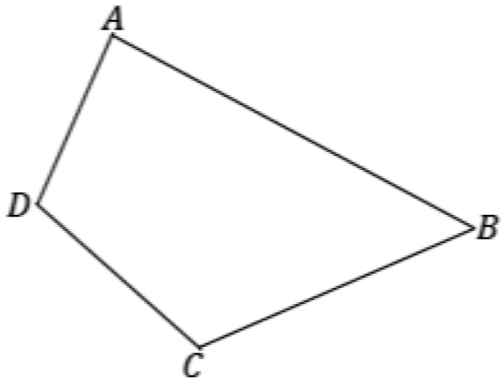


☐ (8) compass, straightedge **Homework:**

☐ (b)

With a ruler and setsquare, use the parallel method to create a scale drawing of quadrilateral $ABCD$ about center O with scale factor $r = \frac{3}{4}$. Verify that the resulting figure is in fact a scale drawing by showing that corresponding side lengths are in constant proportion and that the corresponding angles are equal in measurement.

O



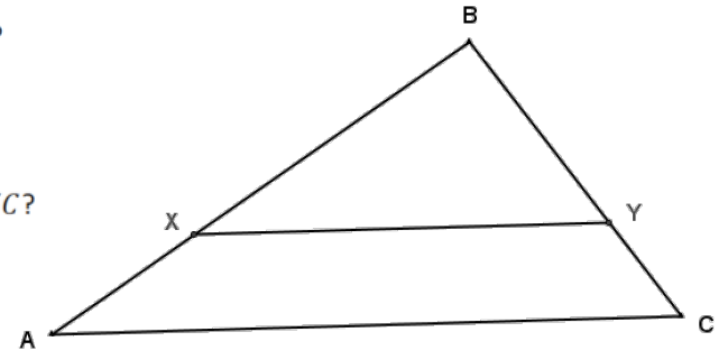
Exit Ticket **Name**_____ **Date** _____ **Per**_____ **5.4R**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

In the diagram, $\overline{XY} \parallel \overline{AC}$. Use the diagram to answer the following:

1. If $BX = 4$, $BA = 5$, and $BY = 6$, what is BC?

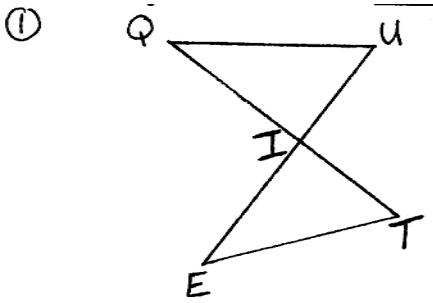
2. If $BX = 9$, $BA = 15$, and $BY = 15$, what is YC?



Not drawn to scale

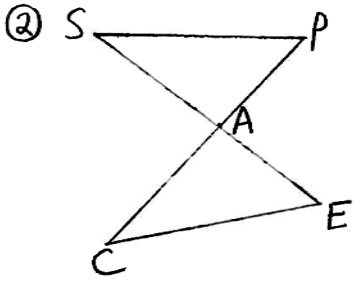
DO NOW **Name**_____ **Date** _____ **Per**_____ **5.4R**

(1) PROOF PROGRESS **K**: Write a proof for #1 or #2. Attach this to the top of your "Proof Progress" packet.

① 

Given: $\overline{QI} \cong \overline{EI}$
$\overline{UI} \cong \overline{TI}$

Prove: $\angle Q \cong \angle T$

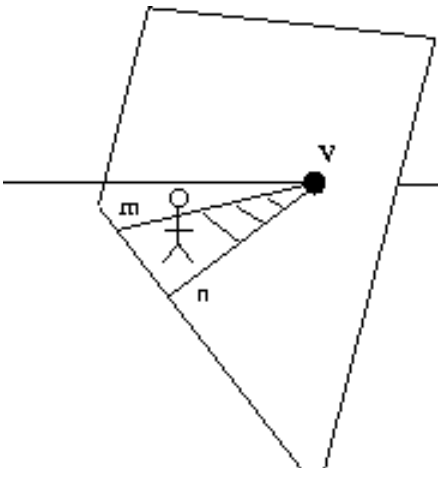
② 

Given: $\overline{SP} \cong \overline{CE}$
$\overline{SA} \cong \overline{CA}$
$\overline{PA} \cong \overline{EA}$

Prove: $\triangle SPA \cong \triangle$ ____

You name the triangle in the

(2) When things are **proportional** they have equal ratios. Use a calculator (or simplify) to verify that the values are **proportional** as the equation suggests.

$$\frac{10}{15} = \frac{2}{3} = \frac{18}{27}$$

(3) In the 3D sketch of a person standing on train tracks at right, what 2 things do you notice about the railroad ties (the pieces connecting the rails)?