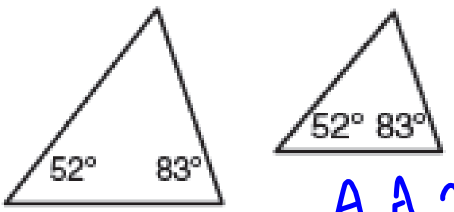
Questions on Lesson 4.2?

We will be taking our content mastery quiz soon!

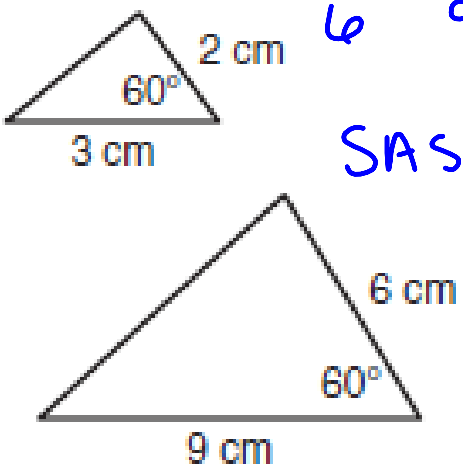
Explain what triangle similarity theorem (**Angle-Angle ~**, **Side-Side-Side ~**, **Side-Angle-Side ~**) you would use to prove the triangles are similar.

1)



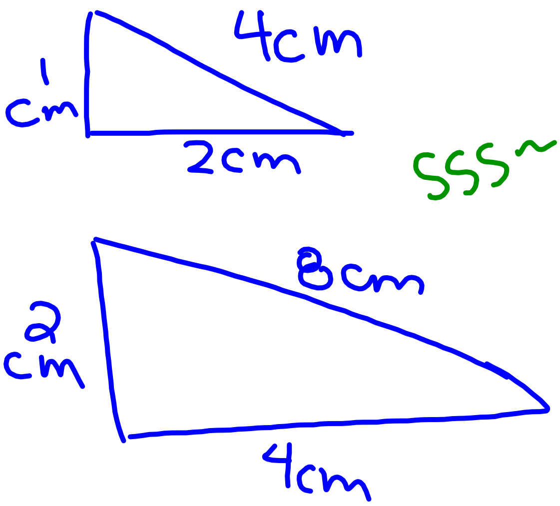
AA~

2)



$\frac{2}{6} = \frac{3}{9}$

SAS~

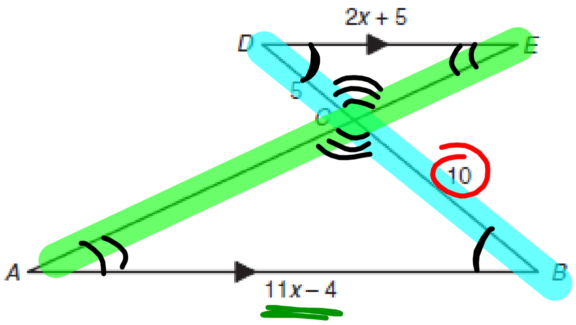


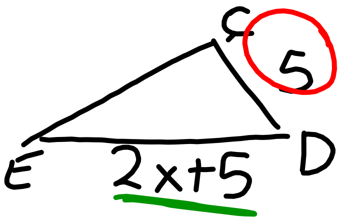
SSS~

FROM LAST CLASS - NOT IN YOUR BOOK, WRITE IN NOTES

B3

. In the figure shown, segments *AB* and *DE* are parallel. The length of segment *BC* is 10 units and the length of segment *CD* is 5 units. Use this information to calculate the value of *x*. Explain how you determined your answer.





$$\frac{11x-4}{2x+5} = \frac{10}{5}$$

$$10(2x+5) = 5(11x-4)$$

$$20x + 50 = 55x - 20$$

$$-20x \qquad -20x$$

$$50 = 35x - 20$$

$$+20 \qquad +20$$

$$\frac{70}{35} = \frac{35x}{35}$$

$$\boxed{2 = x}$$

4.3 Keep It in Proportion

Theorems About Proportionality

PG.286 IN YOUR BOOK

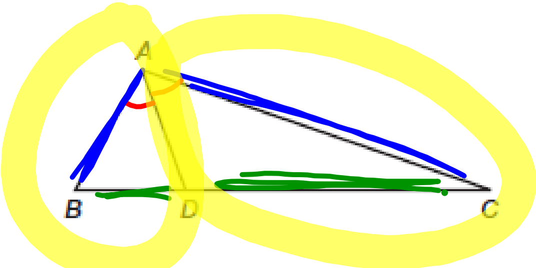
When an interior angle of a triangle is bisected, you can observe proportional relationships among the sides of the triangles formed. You will be able to prove that these relationships apply to all triangles.

The **Angle Bisector/Proportional Side Theorem** states: "A bisector of an angle in a triangle divides the opposite side into two segments whose lengths are in the same ratio as the lengths of the sides adjacent to the angle."

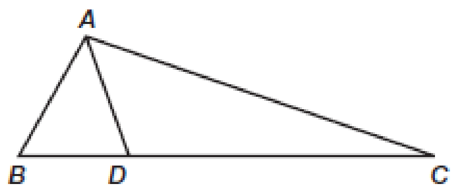
To prove the Angle Bisector/Proportional Side Theorem, consider the statements and figure shown.

Given: $\overline{AD}$ bisects $\angle BAC$

Prove: $\frac{AB}{AC} = \frac{BD}{CD}$



1. Draw a line parallel to $\overline{AB}$ through point C. Extend $\overline{AD}$ until it intersects the line. Label the point of intersection, point E.



PG.287 IN YOUR BOOK

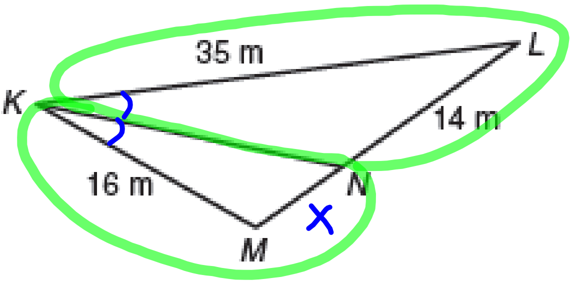
2. Complete the proof of the Angle Bisector/Proportional Side Theorem.

Statements	Reasons
1.	1. Given
2.	2. Construction
3.	3. Definition of angle bisector
4. $\angle BAE \cong \angle CEA$	4.
5.	5. Transitive Property of $\cong$
6.	6. If two angles of a triangle are congruent, then the sides opposite the angles are congruent.
7.	7. Definition of congruent segments
8.	8. Alternate Interior Angle Theorem
9. $\triangle DAB \sim \triangle DEC$	9.
10. $\frac{AB}{EC} = \frac{BD}{CD}$	10.
11.	11. Rewrite as an equivalent proportion
12. $\frac{AB}{BD} = \frac{AC}{CD}$	12.

NOT IN YOUR BOOK, BUT LIKE PROBLEMS ON PAGES 288-290

Calculate the indicated length in each figure.

1. $\overline{KN}$ bisects $\angle K$. Calculate MN.



$$\frac{16}{35} = \frac{x}{14}$$

- OR -

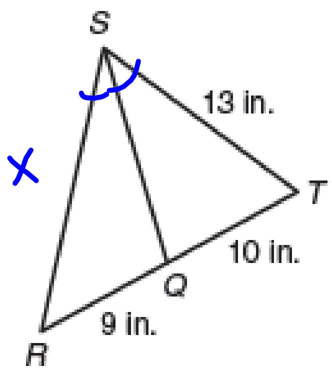
$$\frac{16}{x} = \frac{35}{14}$$

$$35x = 16 \cdot 14$$

$$\frac{\cancel{35}x}{\cancel{35}} = \frac{224}{35}$$

$$x = 6.4\text{m}$$

2. $\overline{SQ}$ bisects $\angle S$. Calculate SR.



$$\frac{x}{9} = \frac{13}{10}$$

$$10x = 9 \cdot 13$$

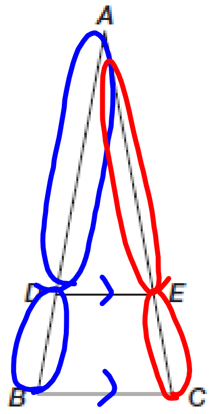
$$\frac{\cancel{10}x}{\cancel{10}} = \frac{117}{10}$$

$$x = 11.7\text{in}$$

Oct 13-8:41 AM

PG.291 IN YOUR BOOK

The **Triangle Proportionality Theorem** states: "If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally."



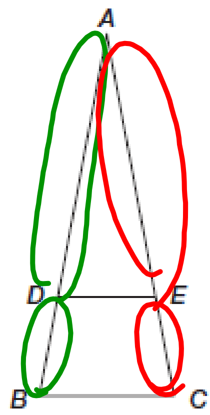
Given: $\overline{BC} \parallel \overline{DE}$

Prove: $\frac{BD}{DA} = \frac{CE}{EA}$

~~1. Write a paragraph proof to prove triangle ADE is similar to triangle ABC.~~ SKIP

PG.296 IN YOUR BOOK

The **Converse of the Triangle Proportionality Theorem** states: "If a line divides two sides of a triangle proportionally, then it is parallel to the third side."



Given: $\frac{BD}{DA} = \frac{CE}{EA}$

Prove: $\overline{BC} \parallel \overline{DE}$

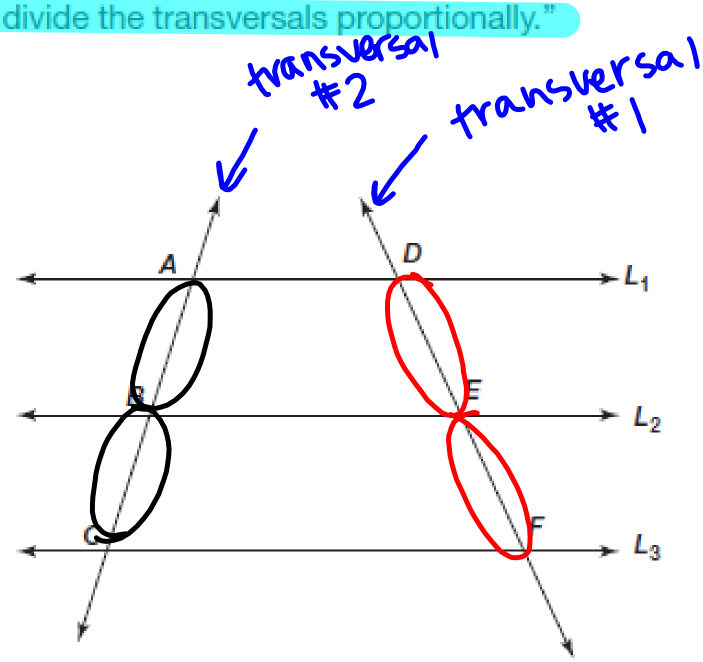
~~Prove the Converse of the Triangle Proportionality Theorem.~~ SKIP

PG.297 IN YOUR BOOK

The **Proportional Segments Theorem** states: “If three parallel lines intersect two transversals, then they divide the transversals proportionally.”

Given: $L_1 \parallel L_2 \parallel L_3$

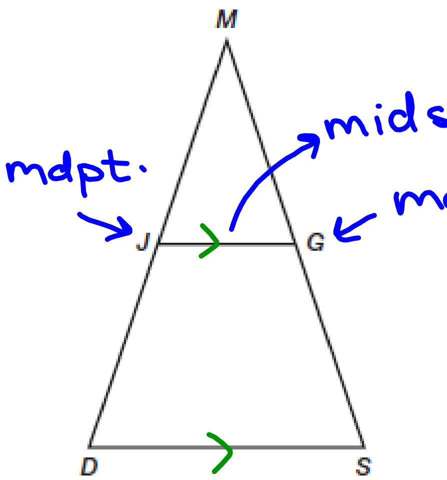
Prove: $\frac{AB}{BC} = \frac{DE}{EF}$



PG.298 IN YOUR BOOK

The **Triangle Midsegment Theorem** states: “The midsegment of a triangle is parallel to the third side of the triangle and is half the measure of the third side of the triangle.”

1. Use the diagram to write the “Given” and “Prove” statements for the Triangle Midsegment Theorem.



Given: J is mdpt. of $\overline{MD}$, G is the mdpt. of $\overline{MS}$

midsegment

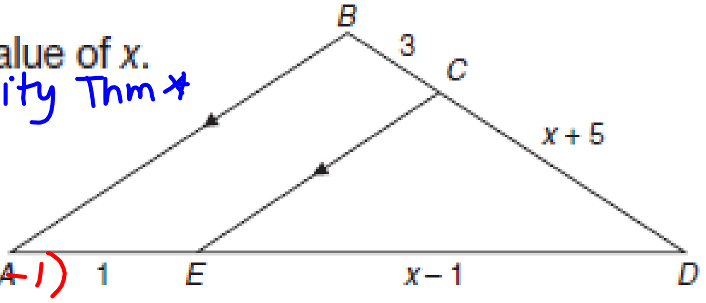
Prove: $\overline{JG} \parallel \overline{DS}$

$JG = \frac{1}{2} DS$

NOT IN YOUR BOOK, WRITE IN NOTES

Given: $\overline{AB} \parallel \overline{CE}$

Calculate the value of x.



△ Proportionality Thm

$$\frac{1}{x-1} = \frac{3}{x+5}$$

$$1(x+5) = 3(x-1)$$

$$x+5 = 3x-3$$

$$-x \qquad -x$$

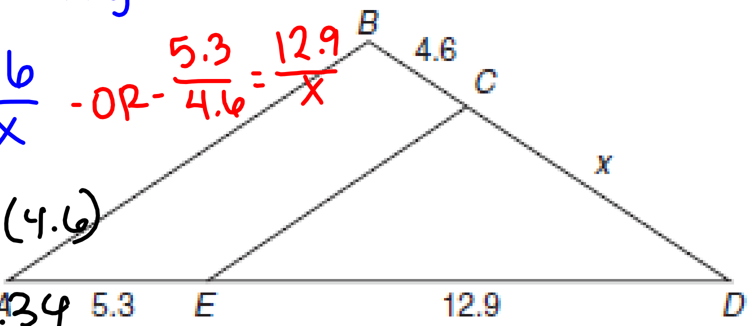
$$5 = 2x-3$$

$$+3 \qquad +3$$

$$\frac{8}{2} = \frac{\cancel{2}x}{\cancel{2}}$$

$$\boxed{4 = x}$$

Calculate a value for x such that $\overline{AB} \parallel \overline{CE}$.



△ Proportionality Thm.

$$\frac{5.3}{12.9} = \frac{4.6}{x} \quad \text{-OR-} \quad \frac{5.3}{4.6} = \frac{12.9}{x}$$

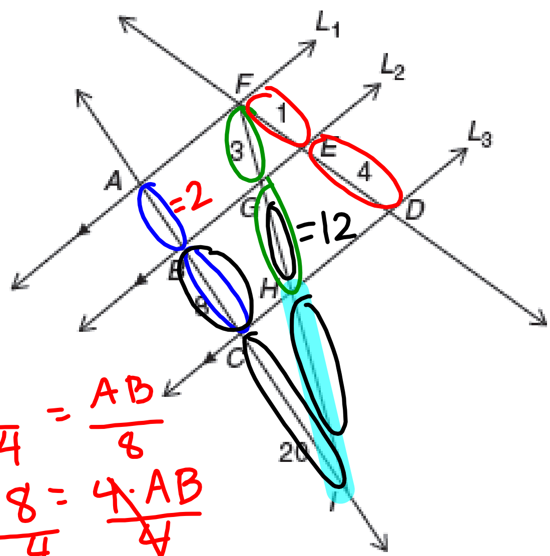
$$5.3x = 12.9(4.6)$$

$$\frac{\cancel{5.3}x}{\cancel{5.3}} = \frac{59.34}{5.3}$$

$$x = 11.2$$

Given: $L_1 \parallel L_2 \parallel L_3$

Calculate HI.



$$\frac{1}{4} = \frac{3}{GH}$$

$$4 \cdot 3 = 1 \cdot GH$$

$$\boxed{12 = GH}$$

$$\frac{1}{4} = \frac{AB}{8}$$

$$\frac{8}{4} = \frac{\cancel{4} \cdot AB}{\cancel{4}}$$

$$\boxed{2 = AB}$$

Homework

Finish 4.3

Aug 24-2:00 PM