

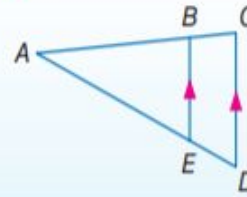
**Theorem 7.5**

**Triangle Proportionality Theorem**

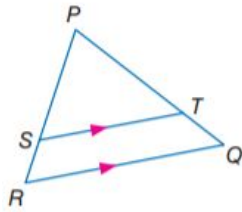
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If a line is parallel to one side of a triangle and intersects the other two sides, then it divides the sides into segments of proportional lengths.

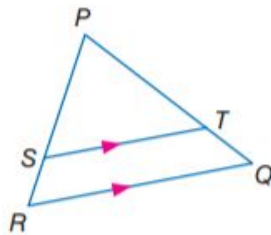
**Example** If  $\overline{BE} \parallel \overline{CD}$ , then  $\frac{AB}{BC} = \frac{AE}{ED}$ .



1. In  $\triangle PQR$ ,  $\overline{ST} \parallel \overline{RQ}$ . If  $PT = 7.5$ ,  $TQ = 3$ , and  $SR = 2.5$ , find  $PS$ .



2. If  $PS = 12.5$ ,  $SR = 5$ , and  $PT = 15$ , find  $TQ$



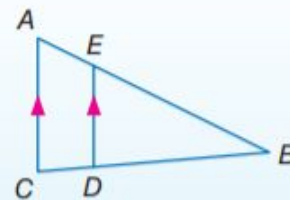
**Theorem 7.6**

**Converse of Triangle Proportionality Theorem**

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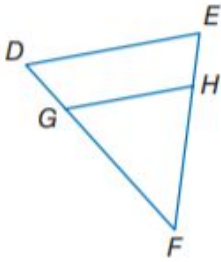
If a line intersects two sides of a triangle and separates the sides into proportional corresponding segments, then the line is parallel to the third side of the triangle.

**Example** If  $\frac{AE}{EB} = \frac{CD}{DB}$ , then  $\overline{AC} \parallel \overline{ED}$ .

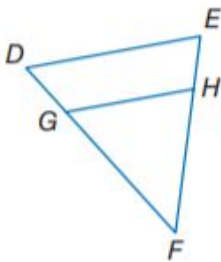


7.4 Parallel Lines and Proportional Parts  
Geometry CP

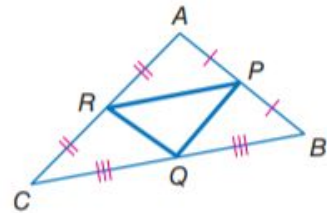
3. In  $\triangle DEF$ ,  $EH = 3$ ,  $HF = 9$ , and  $DG$  is one-third the length of  $\overline{GF}$ . Is  $\overline{DE} \parallel \overline{GH}$ ?



4.  $DG$  is half the length of  $\overline{GF}$ ,  $EH = 6$ , and  $HF = 10$ . Is  $\overline{DE} \parallel \overline{GH}$ ?



**Midsegment of a Triangle:**

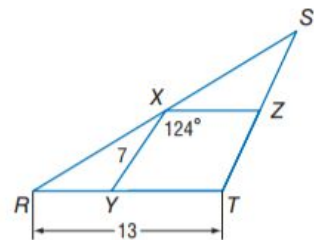


5. In the figure,  $\overline{XY}$  and  $\overline{XZ}$  are midsegments of  $\triangle RST$ . Find each measure.

a.  $XZ$

b.  $ST$

c.  $m\angle RYX$



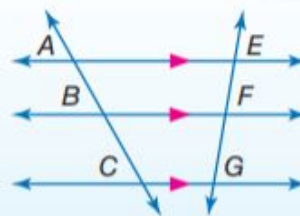
### Corollary 7.1

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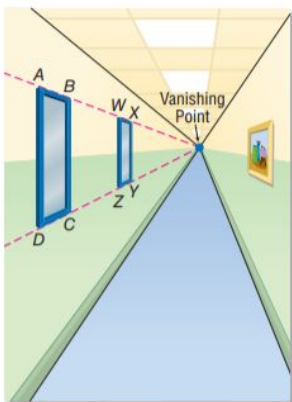
#### Proportional Parts of Parallel Lines

If three or more parallel lines intersect two transversals, then they cut off the transversals proportionally.

**Example** If  $\overline{AE} \parallel \overline{BF} \parallel \overline{CG}$ , then  $\frac{AB}{BC} = \frac{EF}{FG}$ .



6. Megan is drawing a hallway in one-point perspective. She uses the guidelines shown to draw two windows on the left wall. If segments  $\overline{AD}$ ,  $\overline{BC}$ ,  $\overline{WZ}$ , and  $\overline{XY}$  are all parallel,  $AB = 8 \text{ cm}$ ,  $DC = 9 \text{ cm}$ , and  $ZY = 5 \text{ cm}$ , find  $WX$ .



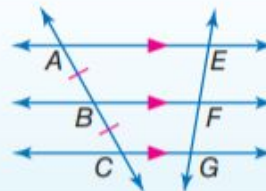
### Corollary 7.2

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#### Congruent Parts of Parallel Lines

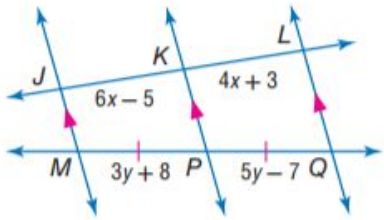
If three or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segments on every transversal.

**Example** If  $\overline{AE} \parallel \overline{BF} \parallel \overline{CG}$ , and  $\overline{AB} \cong \overline{BC}$ , then  $\overline{EF} \cong \overline{FG}$ .

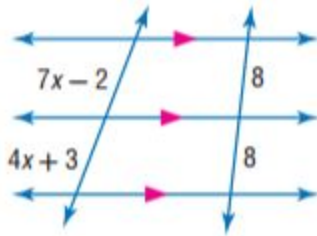


7.4 Parallel Lines and Proportional Parts  
Geometry CP

7. Find  $x$  and  $y$



8. Find  $x$



9. Find  $x$

