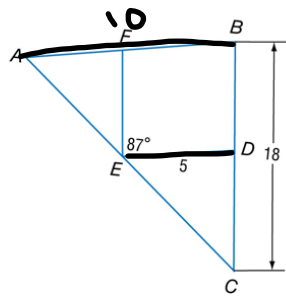
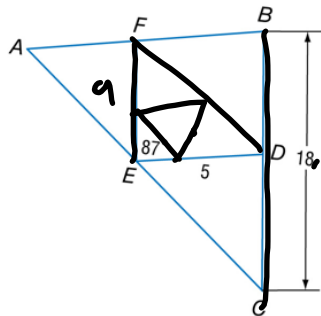


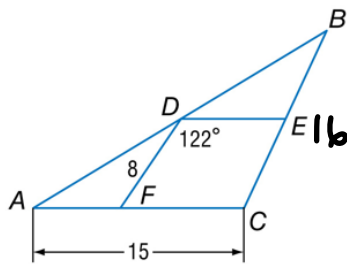
A. In the figure, \overline{DE} and \overline{EF} are midsegments of $\triangle ABC$. Find AB .



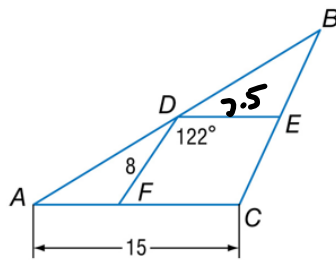
B. In the figure, \overline{DE} and \overline{EF} are midsegments of $\triangle ABC$. Find FE .



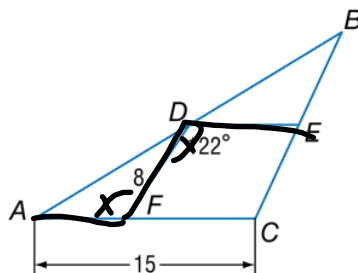
A. In the figure, \overline{DE} and \overline{DF} are midsegments of $\triangle ABC$. Find BC .



B. In the figure, \overline{DE} and \overline{DF} are midsegments of $\triangle ABC$. Find DE .

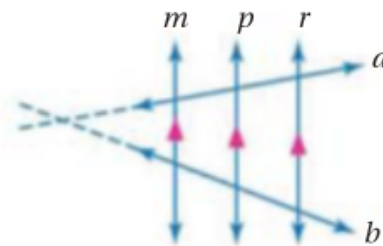


C. In the figure, \overline{DE} and \overline{DF} are midsegments of $\triangle ABC$. Find $m\angle AFD$.



2 Proportional Parts with Parallel Lines

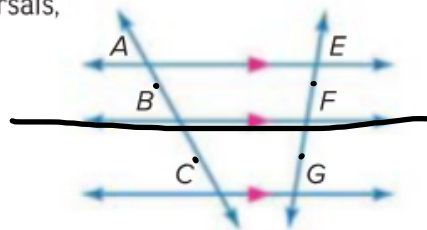
Another special case of the Triangle Proportionality Theorem involves three or more parallel lines cut by two transversals. Notice that if transversals a and b are extended, they form triangles with the parallel lines.



Corollary 7.1 Proportional Parts of Parallel Lines

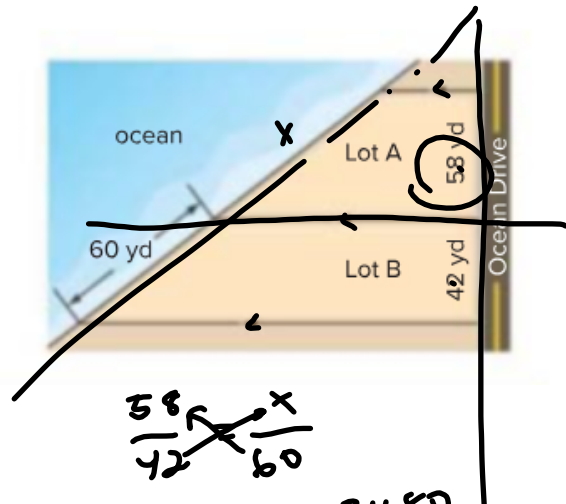
If three or more parallel lines intersect two transversals, then they cut off the transversals proportionally.

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



Guided Practice

4. **REAL ESTATE** Frontage is the measurement of a property's boundary that runs along the side of a particular feature such as a street, lake, ocean, or river. Find the ocean frontage for Lot A to the nearest tenth of a yard.



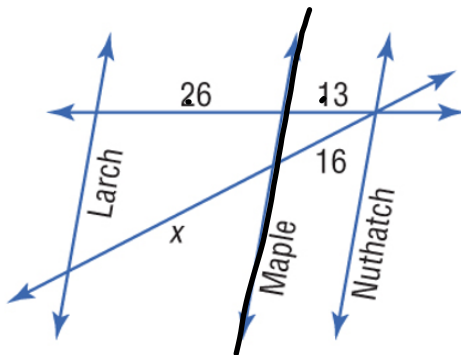
$$\frac{58}{42} = \frac{x}{60}$$

$$42x = 3480$$

$$x = \frac{3480}{42}$$

$$x = 82.9$$

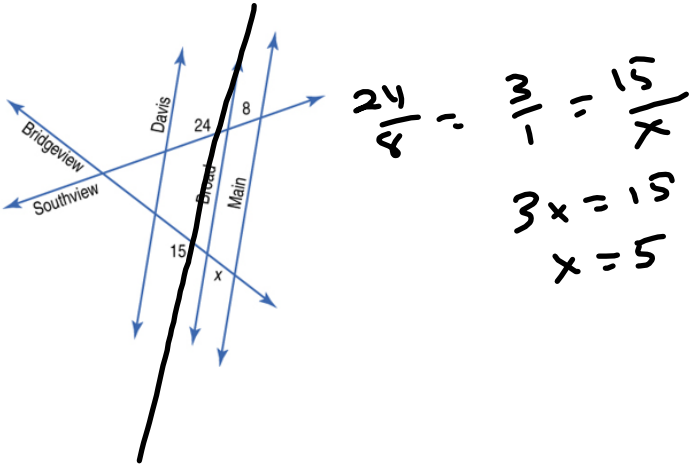
MAPS In the figure, Larch, Maple, and Nuthatch Streets are all parallel. The figure shows the distances in between city blocks. Find x.



$$\frac{26}{13} = \frac{x}{16}$$

$$x = 32$$

In the figure, Davis, Broad, and Main Streets are all parallel. The figure shows the distances in between city blocks. Find x .

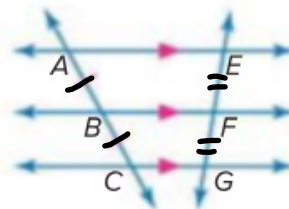


$$\frac{24}{8} = \frac{3}{1} = \frac{15}{x}$$
$$3x = 15$$
$$x = 5$$

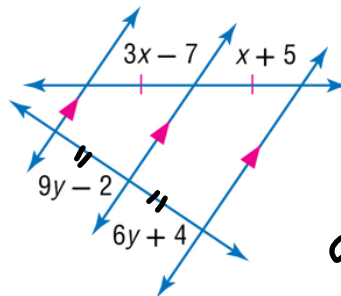
Corollary 7.2 Congruent Parts of Parallel Lines

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 $\overline{EF} \cong \overline{FG}$.



ALGEBRA Find x and y .



$$3x - 7 = x + 5$$

$$2x = 12$$

$$x = 6$$

To find x :

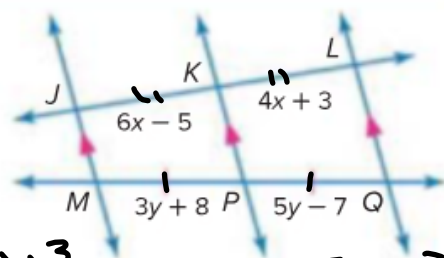
$$9y - 2 = 6y + 4$$

$$3y = 6$$

$$y = 2$$

ALGEBRA Find x and y .

Because $\overline{JM} \parallel \overline{KP} \parallel \overline{LQ}$ and $\overline{MP} \cong \overline{PQ}$, then $\overline{JK} \cong \overline{KL}$ by Corollary 7.2.



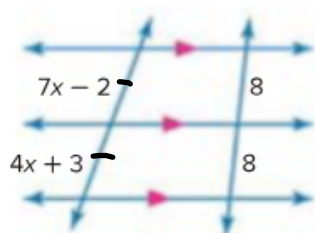
$$6x - 5 = 4x + 3$$

$$x = 4$$

$$3y + 8 = 5y - 7$$

$$\frac{15}{2} = y$$

5A.

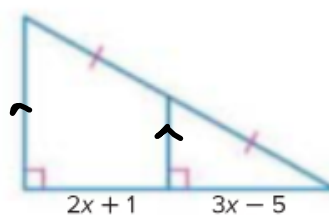


$$7x - 2 = 4x + 3$$

$$3x = 5$$

$$x = \frac{5}{3}$$

5B.

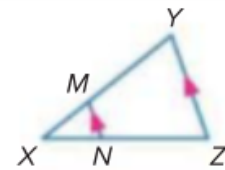


$$2x + 1 = 3x - 5$$

$$x = 6$$

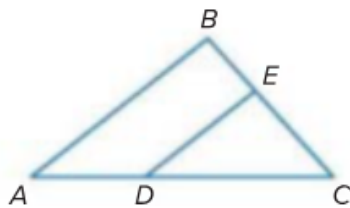
Example 1

1. If $XM = 4$, $XN = 6$, and $NZ = 9$, find XY .
2. If $XN = 6$, $XM = 2$, and $XY = 10$, find NZ .

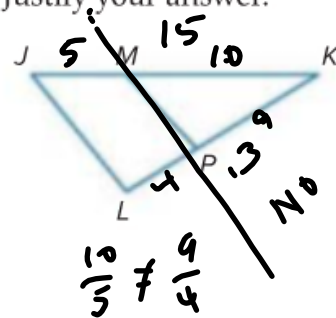


Example 2

3. In $\triangle ABC$, $BC = 15$, $BE = 6$, $DC = 12$, and $AD = 8$. Determine whether $\overline{DE} \parallel \overline{AB}$. Justify your answer.

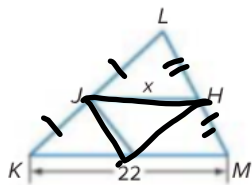


4. In $\triangle JKL$, $JK = 15$, $JM = 5$, $LK = 13$, and $PK = 9$. Determine whether $\overline{JL} \parallel \overline{MP}$. Justify your answer.

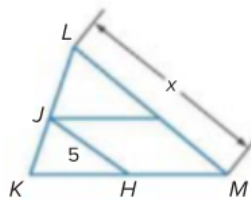


Example 3 \overline{JH} is a midsegment of $\triangle KLM$. Find the value of x .

5.



6.

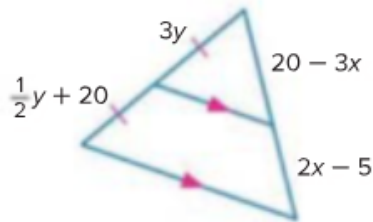


Example 4 7. **MAPS** Refer to the map at the right. 3rd Avenue and 5th Avenue are parallel. If the distance from 3rd Avenue to City Mall along State Street is 3201 feet, find the distance between 5th Avenue and City Mall along Union Street. Round to the nearest tenth.



Example 5 ALGEBRA Find x and y .

8.



$$\frac{1}{2}y + 20 = 3y$$

$$y + 40 = 6y$$

$$40 = 5y$$

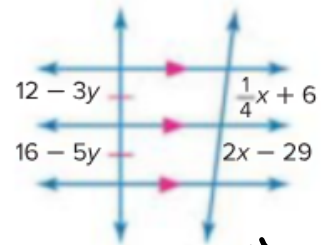
$$8 = y$$

$$20 - 3x = 2x - 5$$

$$25 = 5x$$

$$5 = x$$

9.



$$\frac{1}{4}y + 6 = 2x - 29$$

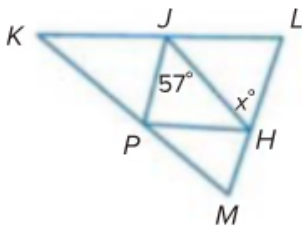
$$y + 24 = 8x - 116$$

$$140 = 7x$$

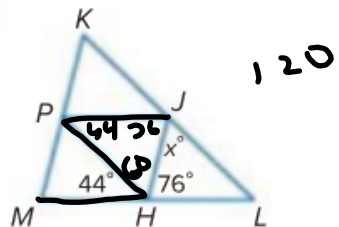
$$20 = x$$

\overline{JH} , \overline{JP} , and \overline{PH} are midsegments of $\triangle KLM$. Find the value of x .

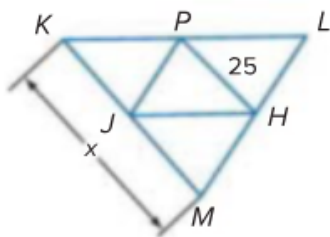
18.



19



20.



21.

