8.4 Start Thinking

In the diagram, $\overrightarrow{BE} \parallel \overleftrightarrow{CD}$ and $\overrightarrow{BE}$ bisects $\angle ABD$. Examine the diagram and make conclusions regarding congruent angles, congruent segments, similar triangles, and proportionality.
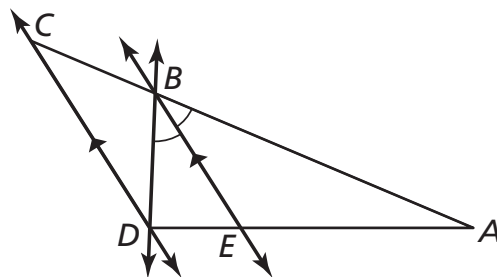
8.4 Warm Up

Solve the proportion.

1. $\dfrac{x-1}{3} = \dfrac{2x}{5}$

2. $\dfrac{2x+3}{3x} = \dfrac{4}{9}$

3. $\dfrac{2x}{x+3} = \dfrac{3x}{x-3}$
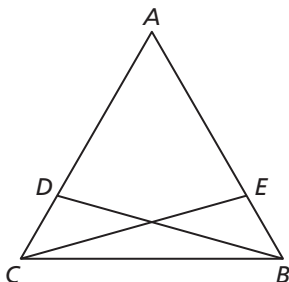
4. $\dfrac{x}{2x+1} = \dfrac{5}{4-x}$

5. $\dfrac{2}{1-x} = \dfrac{x-8}{x+1}$

6. $\dfrac{x}{2x-6} = \dfrac{2}{x-4}$
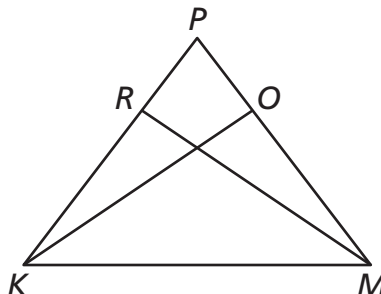
8.4 Cumulative Review Warm Up

Prove the triangles are congruent.

1. **Given:** $\overline{AC} \cong \overline{AB}$, $\overline{AD} \cong \overline{AE}$ **Prove:** $\triangle ADB \cong \triangle AEC$

2. **Given:** $\overline{MR} \perp \overline{KP}$, $\overline{KO} \perp \overline{PM}$
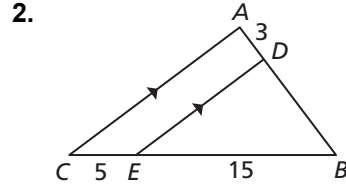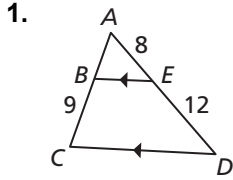 $\angle RKM \cong \angle OMK$

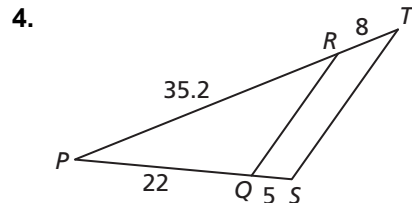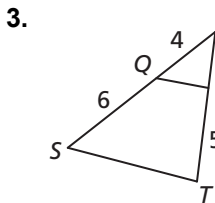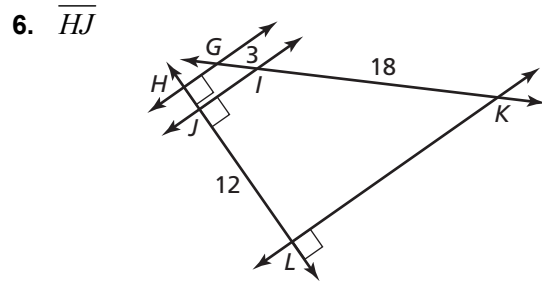   **Prove:** $\triangle RKM \cong \triangle OMK$
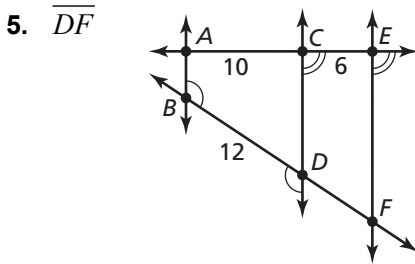
Name_____ Date _____

8.4 Practice A

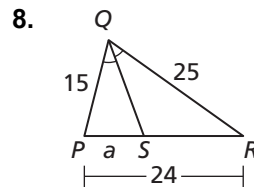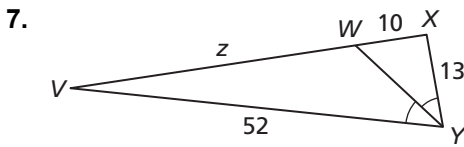**In Exercises 1 and 2, find the length of $\overline{AB}$.**

1.

2.

In Exercises 3 and 4, determine whether $\overline{QR} \parallel \overline{ST}$.

3.

4.

In Exercises 5 and 6, find the length of the indicated line segment.

5. $\overline{DF}$

6. $\overline{HJ}$

In Exercises 7 and 8, find the value of the variable.

7.

8.

9. The diagram shows the skyline of a city. Find the distance between point E and point F for which $\overline{BE} \parallel \overline{CF}$. Explain your reasoning.
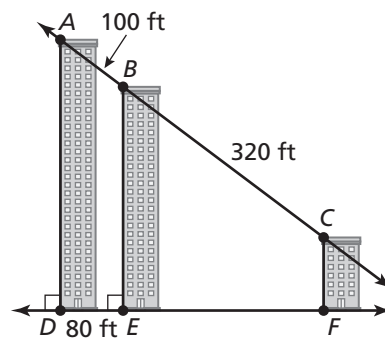
Name _____ Date _____

In Exercises 1 and 2, find the length of the indicated line segment.
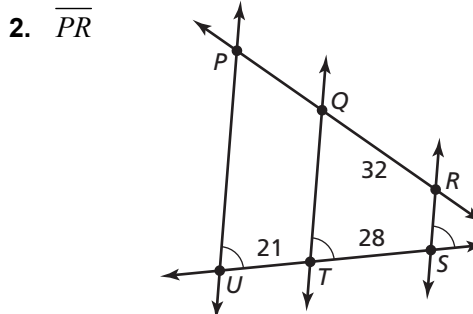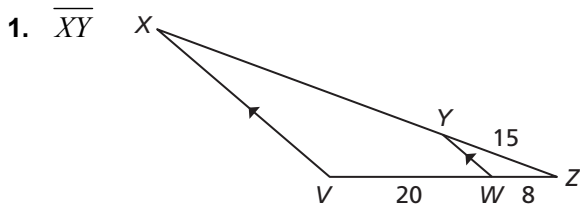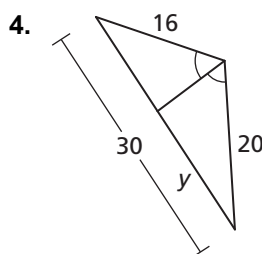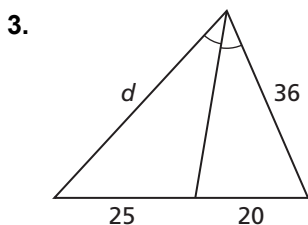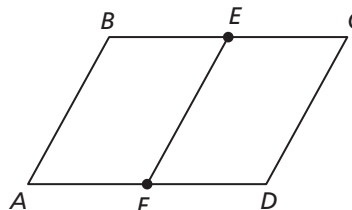
1. $\overline{XY}$

2. $\overline{PR}$

In Exercises 3 and 4, find the value of the variable.

3.

4.

5. The figure shows parallelogram $ABCD$, where E and F are the midpoints of $\overline{BC}$ and $\overline{AD}$ respectively. Your friend claims that $\overline{EF}$ is parallel to $\overline{AB}$ and $\overline{CD}$ by the Three Parallel Lines Theorem (Theorem 8.8). Is your friend correct? Explain your reasoning.

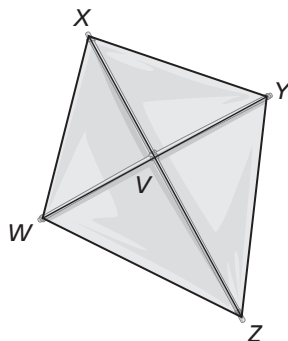**6.** The figure shows a triangle such that the length of $\overline{LP}$ is nine less than twice the length of $\overline{PN}$. Do you have enough information to find LP and PN? Explain your reasoning. If so, find LP and PN.
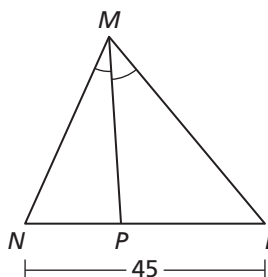
7. Use the diagram to write a two-column proof.

Given: $\overline{WY}$ bisects $\angle XYZ$.

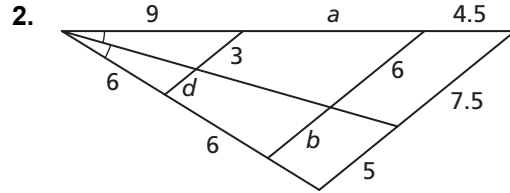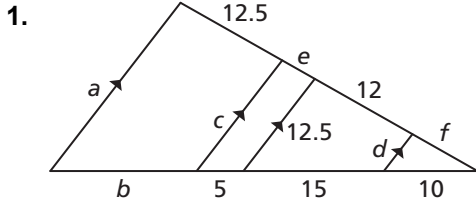$\overline{YW}$ bisects $\angle XWZ$.

$YZ \cong WZ$

Prove: $WXYZ$ is a kite.

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Proportionality Theorems

**Use the diagram to find the value of each variable.**

1.

2.

3. You take a picture of a painting at an art gallery. The painting is above eye level, and you frame the painting so the top and bottom match with the top and bottom of your view finder. Your camera's auto-focus feature focuses at the height of the angle bisector shown in the diagram. How far from the bottom of the painting is the focus?
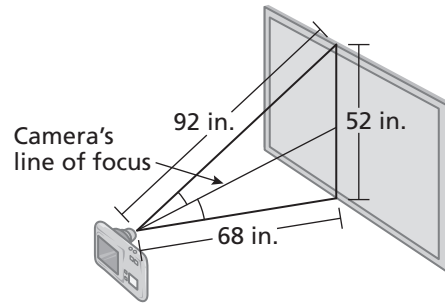
4. In the diagram, $\overline{WX} \parallel \overline{YZ}$ and $\overline{XV} \parallel \overline{ZS}$.

   a. Find the value of x.

   b. Find the value of y.

   c. Find the perimeter of $\triangle ZQS$.
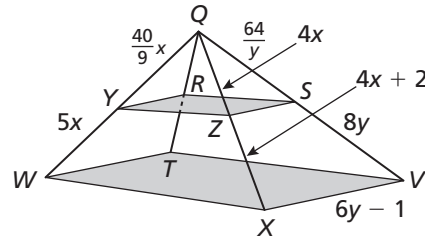
5. In $\triangle ABC$, altitude $\overline{BE}$ is extended so that EG equals the measure of altitude $\overline{CF}$. A line through G and parallel to $\overrightarrow{AC}$ meets $\overrightarrow{BA}$ at H. Prove that $AH = AC$.

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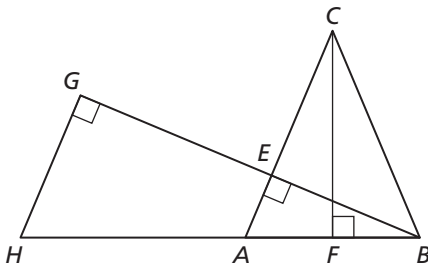
 8.4 **Puzzle Time**

What Part Of A Car Is The Laziest?

A	B	C	D	E	F
G					

Complete each exercise. Find the answer in the answer column. Write the word under
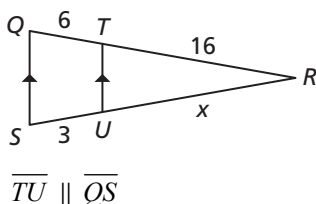the answer in the box containing the exercise letter.
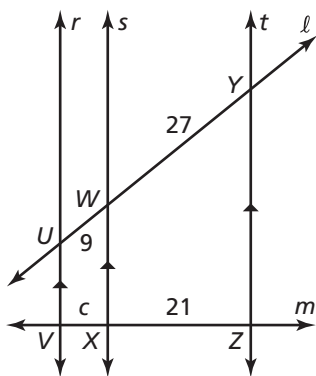
Complete the sentence.

A. If a line _____ to one side of a triangle intersects the
other two sides, then it divides the two sides proportionally.

B. If a line divides two _____ of a triangle proportionally,
then it is parallel to the third side.

C. If _____ parallel lines intersect two transversals, then
they divide the transversals proportionally.

D. If a(n) _____ bisects an angle of a triangle, then it divides
the opposite side into segments whose lengths are
proportional to the lengths of the other two sides.
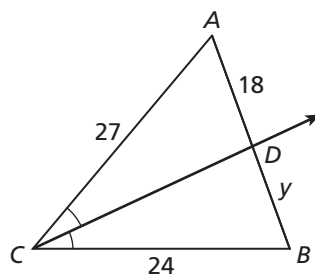
Find the indicated value.

E. Find x.

$\overline{TU} \parallel \overline{QS}$

F. Find c.

G. Find y.

Answer column (left):

6 STOP	
perpendicular BRAKES	
parallel THE	
two SIT	
sides WHEELS	
16 TIRED	
3 AND	

Answer column (right):

8 ARE	
line LINES	
7 ALWAYS	
angles REST	
ray THEY	
36 RUN	
three BECAUSE	