

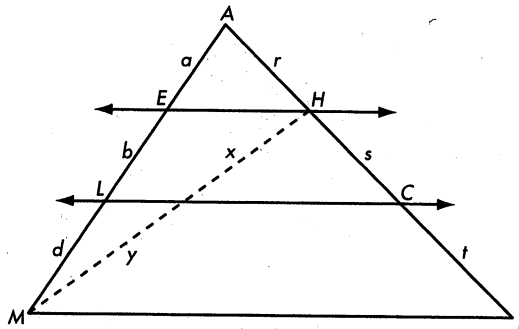
The conjecture states: If two or more lines pass through two sides of a triangle parallel to the third side, then they divide the two sides proportionally.

Conjecture: If $\overleftrightarrow{EH} \parallel \overleftrightarrow{LC} \parallel \overleftrightarrow{MI}$, then $\frac{b}{d} = \frac{s}{t}$.

Given: $\overleftrightarrow{EH} \parallel \overleftrightarrow{LC} \parallel \overleftrightarrow{MI}$

Show: $\frac{b}{d} = \frac{s}{t}$

Because you must connect b , d , s , and t into one equation, you construct \overline{MH} . This gives you $\triangle HEM$ with $\overline{LC} \parallel \overline{EH}$ and $\triangle MIH$ with $\overline{LC} \parallel \overline{MI}$. Write a proof for the Extended Parallel Proportionality Conjecture.



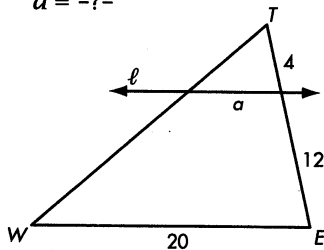
- 4.* Is the converse of the Extended Parallel Proportionality Conjecture true? That is, if two lines intersect two sides of a triangle, dividing the two sides proportionally, must the two lines be parallel to the third side? Prove it is true or find a counterexample proving it is not true.
5. Sketch and label a plane intersecting a pyramid parallel to the base of the pyramid. State a conjecture about planes intersecting pyramids parallel to the base of the pyramid. Test your conjecture. Can you explain why you think your conjecture is true?
6. If the three sides of one triangle are parallel to the three sides of another triangle, what might be true about the two triangles? Use a geometry computer program to investigate. Make a conjecture and explain why you think your conjecture is true.



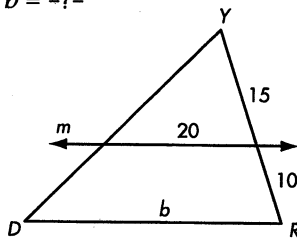
Exercise Set 12.7

All measurements are in centimeters.

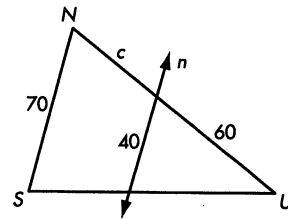
1.* $\ell \parallel \overline{WE}$
 $a = \text{?}$

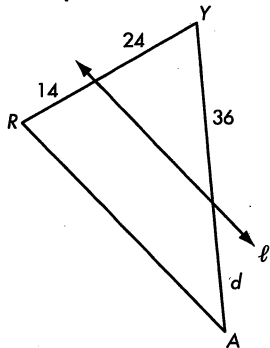


2. $m \parallel \overline{DR}$
 $b = \text{?}$

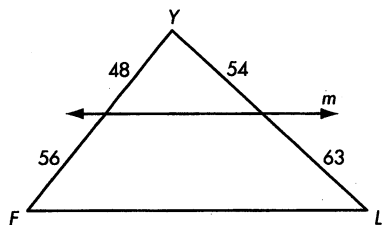


3.* $n \parallel \overline{SN}$
 $c = \text{?}$

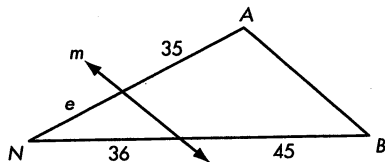
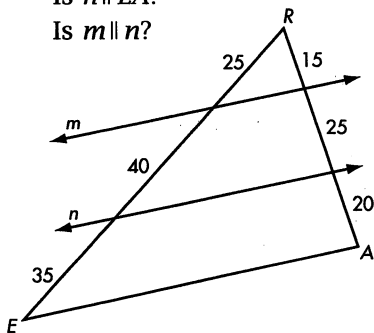




7. Is $m \parallel \overline{FL}$?

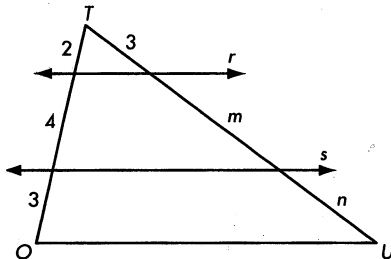


10. Is $m \parallel \overline{EA}$?
Is $n \parallel \overline{EA}$?
Is $m \parallel n$?



8. $r \parallel s \parallel \overline{OU}$

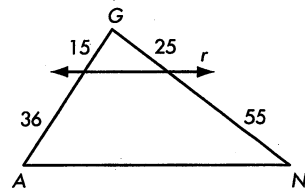
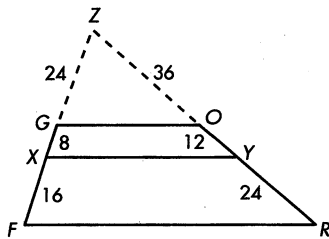
$$m = \text{---} \quad n = \text{---}$$



11. Is $\overline{XY} \parallel \overline{OG}$?

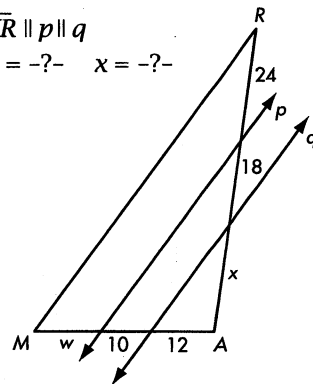
Is $\overline{XY} \parallel \overline{FR}$?

Is FROG a trapezoid?



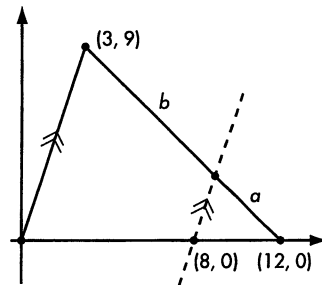
9. $\overline{MR} \parallel p \parallel q$

$$w = \text{---} \quad x = \text{---}$$



12.* $a = \text{---}$

$b = \text{---}$



In Exercises 13 and 14, use your compass and straightedge to complete each task.

13. Draw \overline{EF} . Then divide it into five equal parts.

14.* Draw \overline{IJ} . Then construct a regular hexagon with IJ as the perimeter.

15. The ratio of the volumes of two similar cylinders is 27:64. What is the ratio of the diameters of their similar bases?

16.* The surface areas of two cubes are in the ratio of 49:81. What is the ratio of their volumes?