

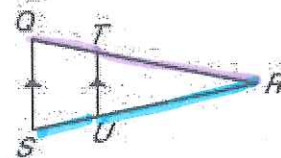
Learning Target(s): I am able to use proportions with triangles to solve problems.
 I am able to use proportions with parallel lines to solve problems.

Notes: 6.6 Use Proportionality Theorems

Triangle Proportionality Theorem:

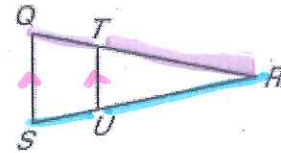
If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.

$$\frac{RT}{TO} = \frac{RU}{US}$$



Converse of the Triangle Proportionality Theorem:

If a line divide two sides of a triangle proportionally, then it is parallel to the third side.



Ex. 1

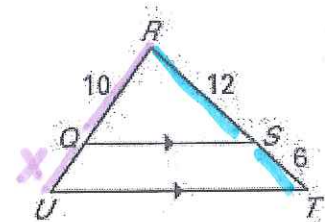
In the diagram, $\overline{QS} \parallel \overline{UT}$, $RQ = 10$, $RS = 12$, and $ST = 6$. What is the length of QU ?

$$\frac{10}{x} = \frac{12}{6}$$

$$12x = 60$$

$$\frac{12x}{12} = \frac{60}{12}$$

$$x = 5$$

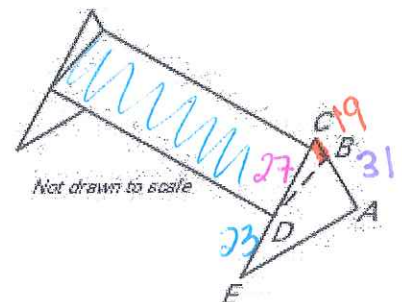


Ex. 2

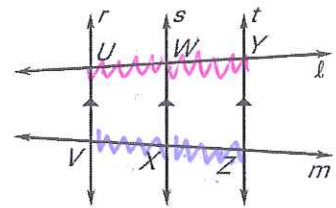
A spoiler for a remote controlled car is shown where $AB = 31$ mm, $BC = 19$ mm, $CD = 27$ mm, and $DE = 23$ mm. Explain why BD is not parallel to AE .

$$\frac{19}{31} \neq \frac{27}{23}$$

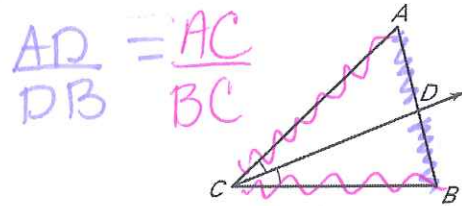
Not in proportion



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



If a ray 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.



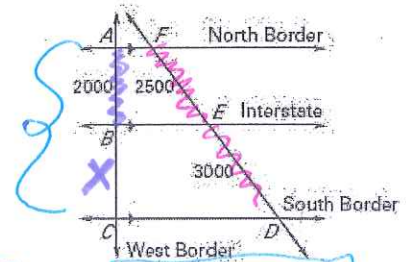
Ex. 3

A farmer's land is divided by a newly constructed interstate. The distances shown are in meters. Find the distance CA between the north border and the south border of the farmer's land.

$$\frac{2000}{2500} \times \frac{x}{3000}$$

$$\frac{2000}{x} \times \frac{2500}{3000}$$

$$x = 2400$$



$$2000 + 2400 = 4400 \text{ m}$$

Ex. 4

In the diagram, $\angle DEG \cong \angle GEF$. Use the given side lengths to find the length of DG.

$$\frac{x}{14-x} = \frac{8}{12}$$

$$12x = 8(14-x)$$

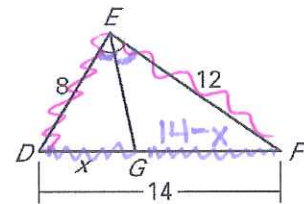
$$12x = 112 - 8x$$

$$+8x \quad +8x$$

$$20x = 112$$

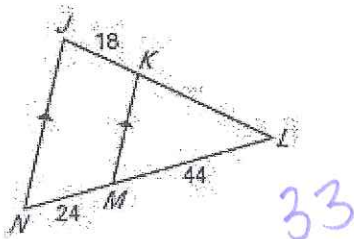
$$\frac{20x}{20} = \frac{112}{20}$$

$$x = 5.6$$



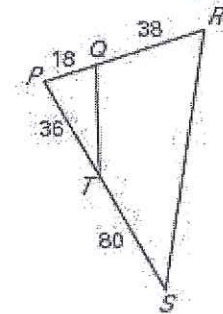
Try it!

1. Find the length of KL.



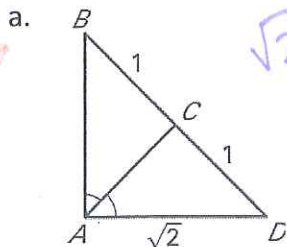
$$33$$

2. Determine whether $\overline{QT} \parallel \overline{RS}$.



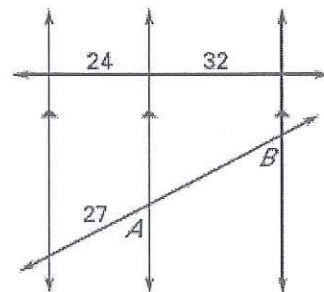
No!

3. Find the length of AB.



$\sqrt{2}$ or 1.4

b.



$$36$$