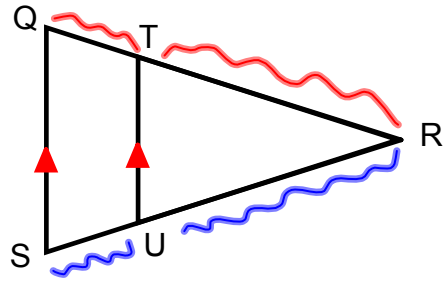
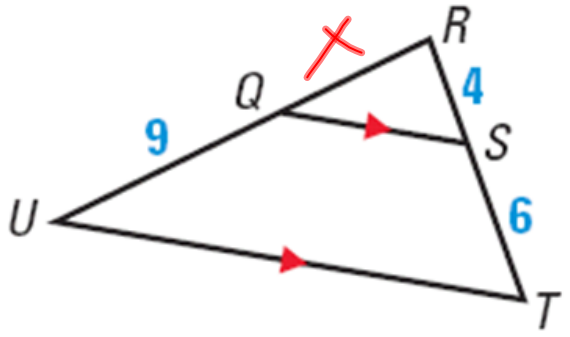
Chapter 6.6: Using Proportionality Theorems

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



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

What is RQ?



$\frac{4}{6} = \frac{x}{9}$

$\frac{9}{x} = \frac{6}{4}$

$9 \cdot 4 = x \cdot 6$

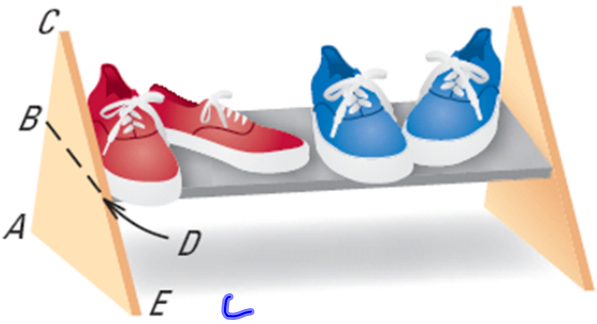
$6x = 36$

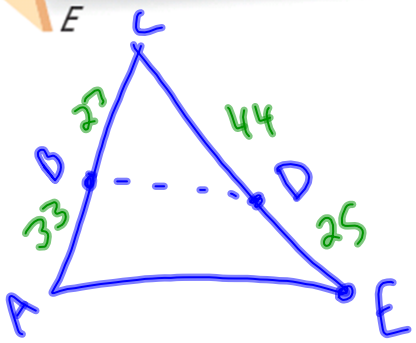
$\frac{6x}{6} = \frac{36}{6}$

$x = 6$

QR = 6

On the shoe rack shown, AB=33, BC=27. CD=44 and DE=25. Why is the grey shelf not parallel to the floor?



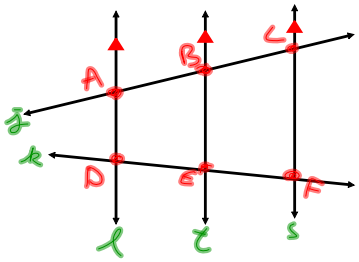


$\frac{44}{25} = \frac{27}{33}$

$\frac{44}{25} = \frac{9}{11}$

$\overline{BD} \nparallel \overline{AE}$

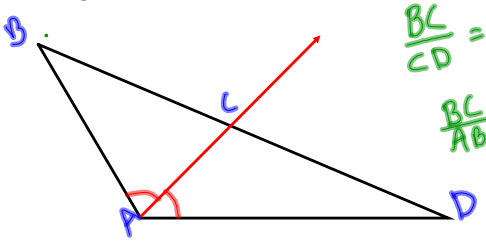
Theorem 6.6: If three parallel lines intersect two transversals, then they divided the transversals proportionally.



$\frac{AB}{DE} = \frac{BC}{EF}$

$\frac{AB}{BC} = \frac{DE}{EF}$

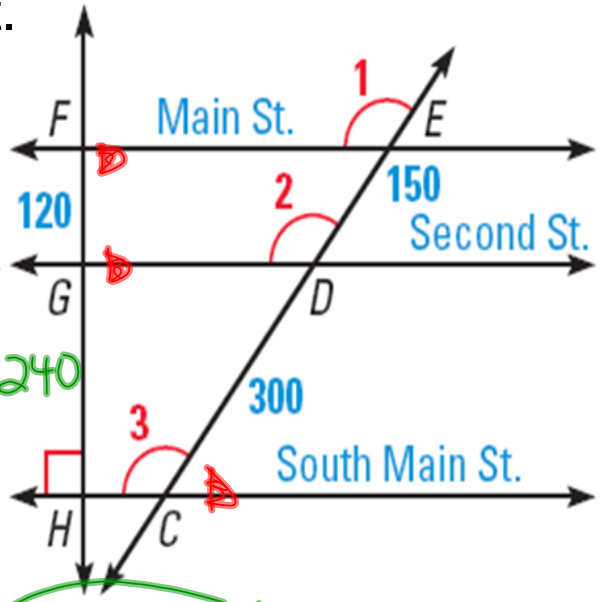
Theorem 6.7: If a ray bisects an angle of a triangle, then it divides the opposite side into segments whose lengths are proportional to the lengths of the other two sides.



$\frac{BC}{CD} = \frac{BA}{DA}$

$\frac{BC}{AB} = \frac{CD}{DA}$

Find the distance from Main St. to South Main St.



$\overleftrightarrow{FE} \parallel \overleftrightarrow{GD} \parallel \overleftrightarrow{AC}$

$\cong$ corresponding $\angle$s

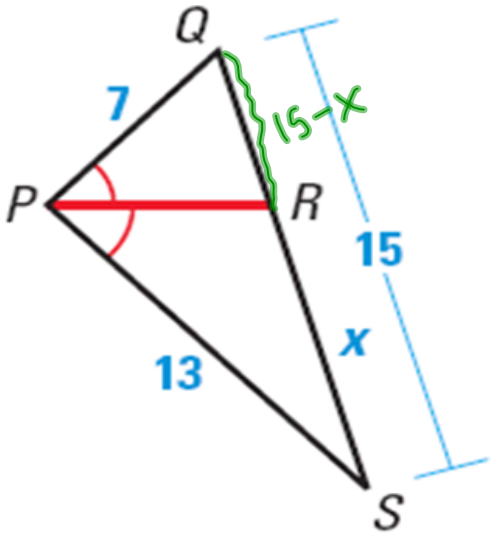
$\frac{120}{150} \times \frac{x}{300}$

$\frac{150x}{150} = \frac{36000}{150}$

$x = 240$

$FH = 360$

Find the length of RS



$\frac{13}{7} = \frac{x}{15-x}$

$7x = 13(15-x)$

$7x = 195 - 13x$

$+13x \quad +13x$

$\frac{20x}{20} = \frac{195}{20}$

$x = 9.75$

$QR = 5.25$

Homework: Chapter 6.6
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