Geometry

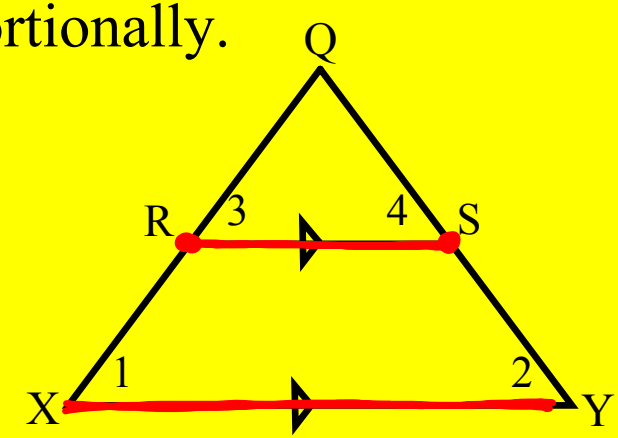
Ch. 7 Handout 7.5

Proportions in Triangles

Theorem 7-4: Side-Splitter Theorem

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

$$\frac{QR}{RX} = \frac{QS}{SY}$$

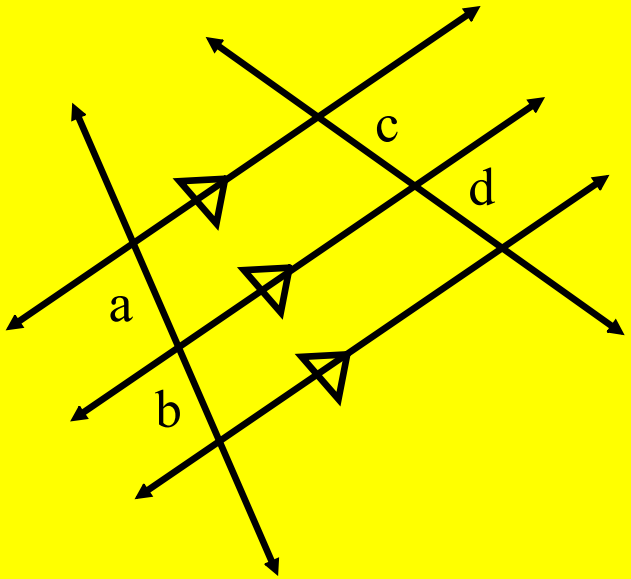


http://www.geogebra.org/m/135066

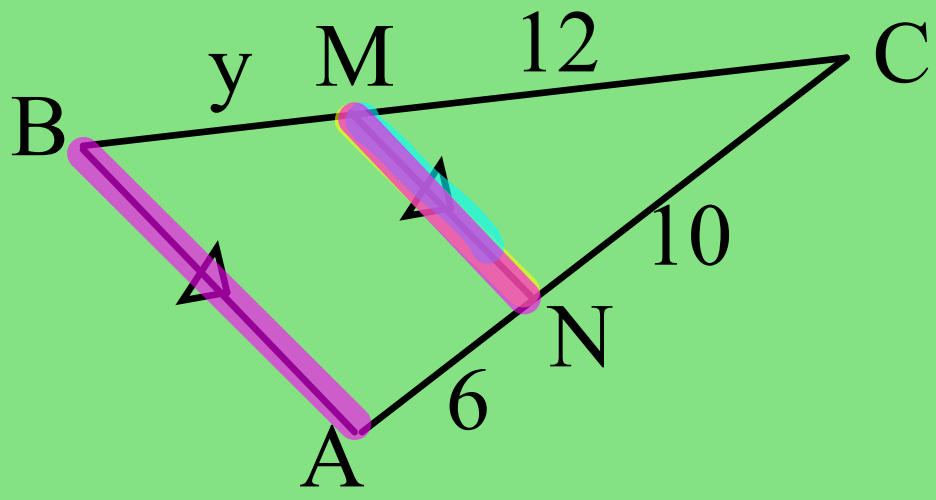
Corollary to Theorem 7-4

If three parallel lines intersect two transversals, then the segments intercepted on the transversals are proportional.

$$\frac{a}{b} = \frac{c}{d}$$



1. Find y.



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

$$10y = 72$$

$$\boxed{y = 7.2}$$

2. The segments joining the sides of trapezoid RSTU are parallel to its bases. Find x and y.

$\frac{6}{x} = \frac{5}{12.5}$

$5x = 75$

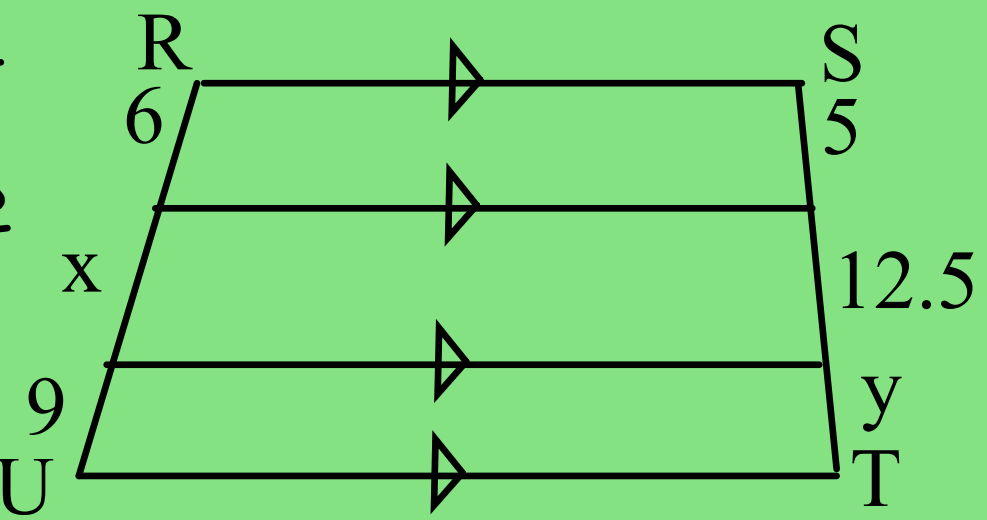
$x = 15$

$\frac{6}{9} = \frac{5}{y}$

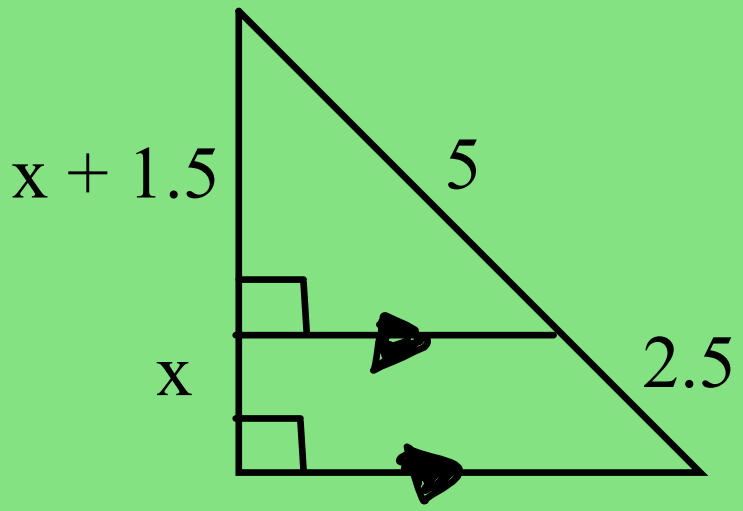
$\frac{6y}{6} = \frac{45}{6}$

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

$y = 7.5$



3. Find the value of x.



$\frac{x+1.5}{x} = \frac{5}{2.5}$

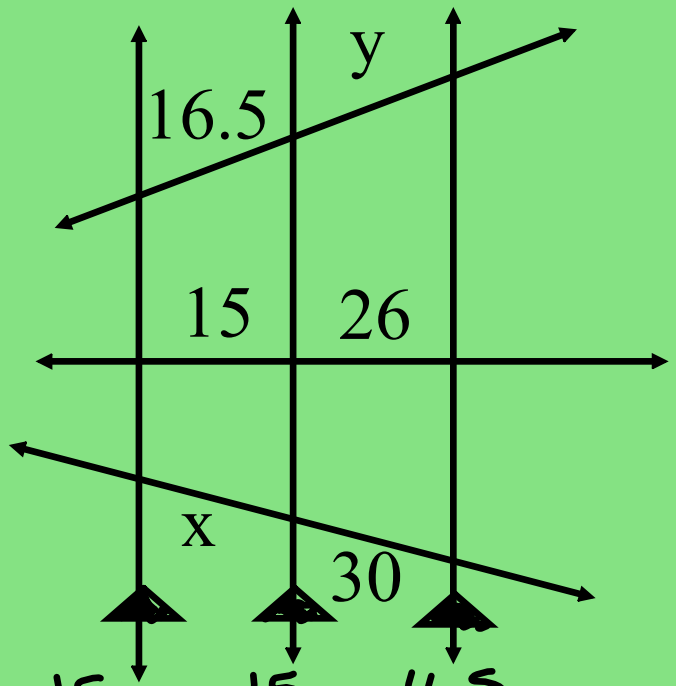
$2.5(x+1.5) = 5x$

$2.5x + 3.75 = 5x$

$-2.5x \qquad -2.5x$

$3.75 = 2.5x$

$X = 1.5$



$\frac{x}{30} = \frac{15}{26}$

$26x = 450$

$x = \frac{225}{13}$

$x \approx 17.3$

$\frac{15}{24} = \frac{16.5}{y}$

$15y = 429$

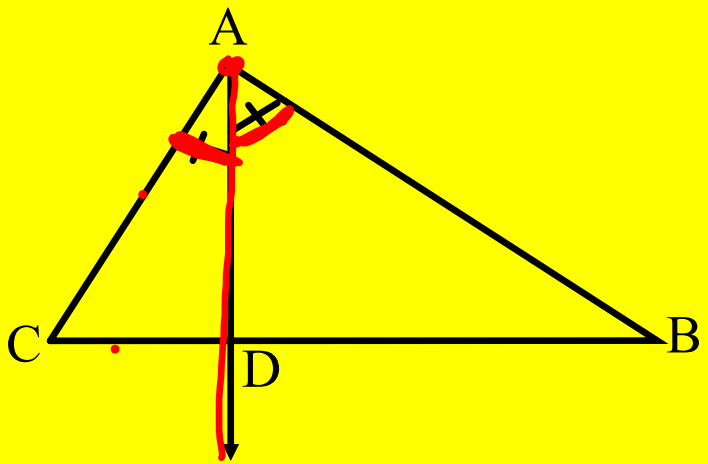
$y = \frac{429}{15}$

$y = \frac{143}{5}$ $y \approx 28.6$

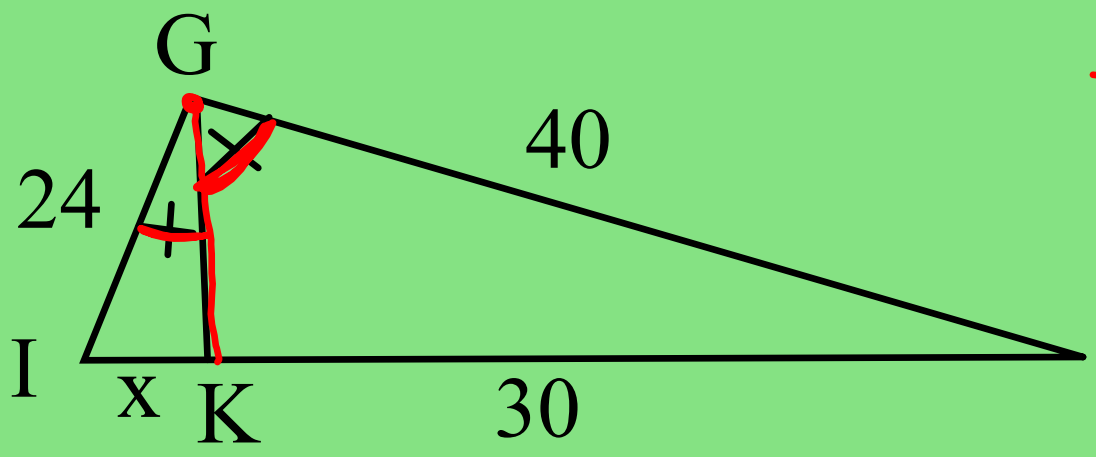
Theorem 7-5: Triangle-Angle-Bisector Theorem

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

$$\frac{CD}{DB} = \frac{CA}{AB}$$



4. Find the value of x.

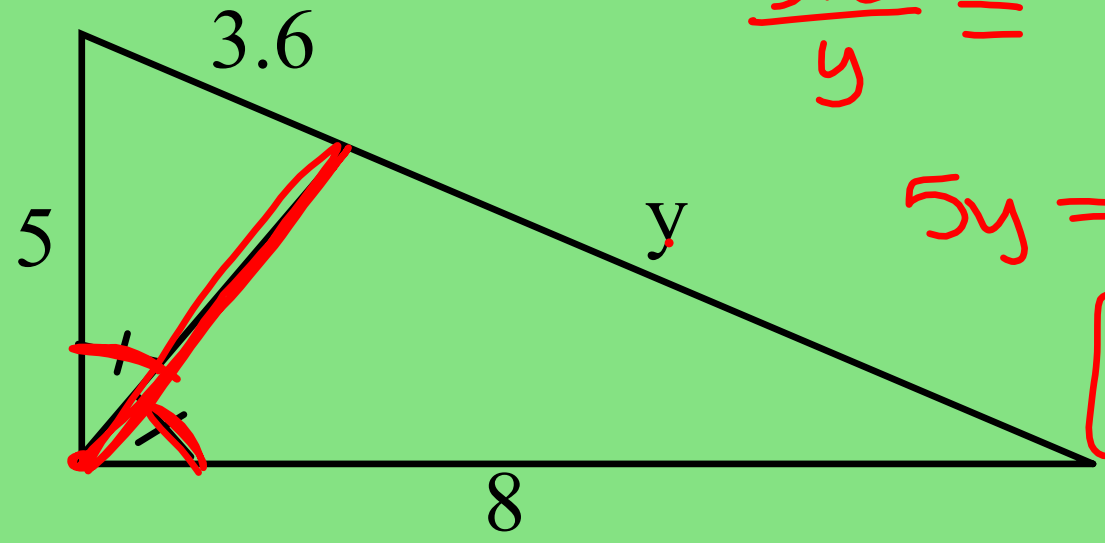


$\frac{x}{30} = \frac{24}{40}$

$40x = 720$

$x = 18$

5. Find the value of y.



$\frac{3.6}{y} = \frac{5}{8}$

$5y = 28.8$

$y = 5.76$

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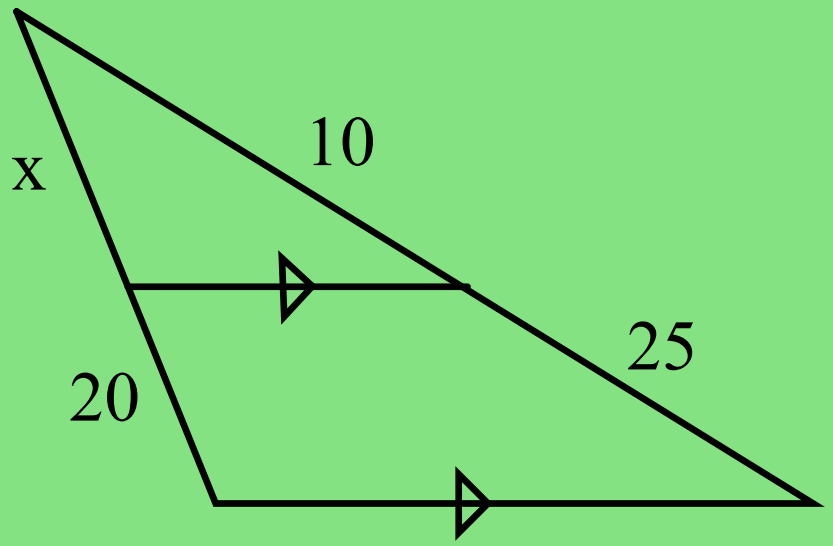
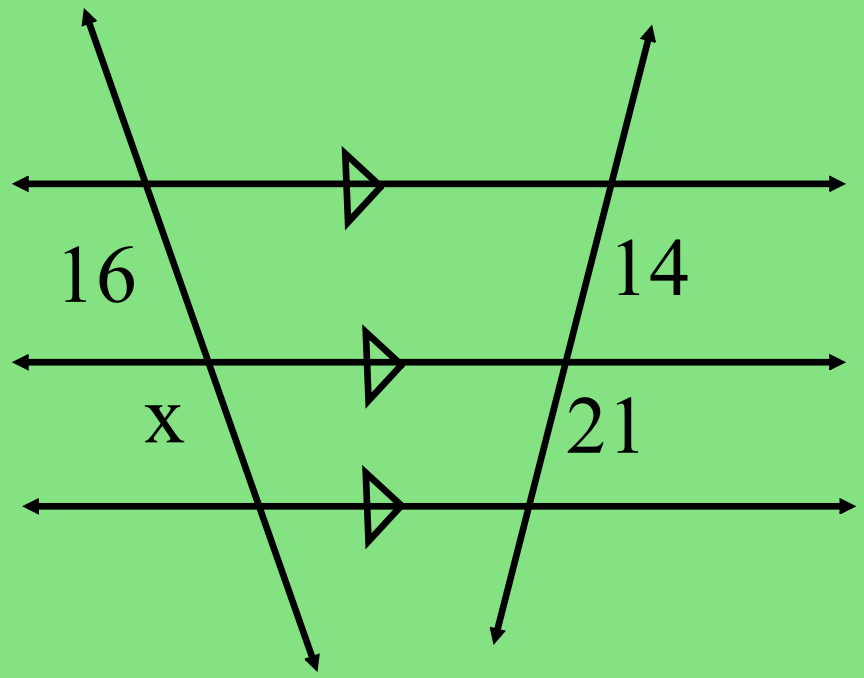
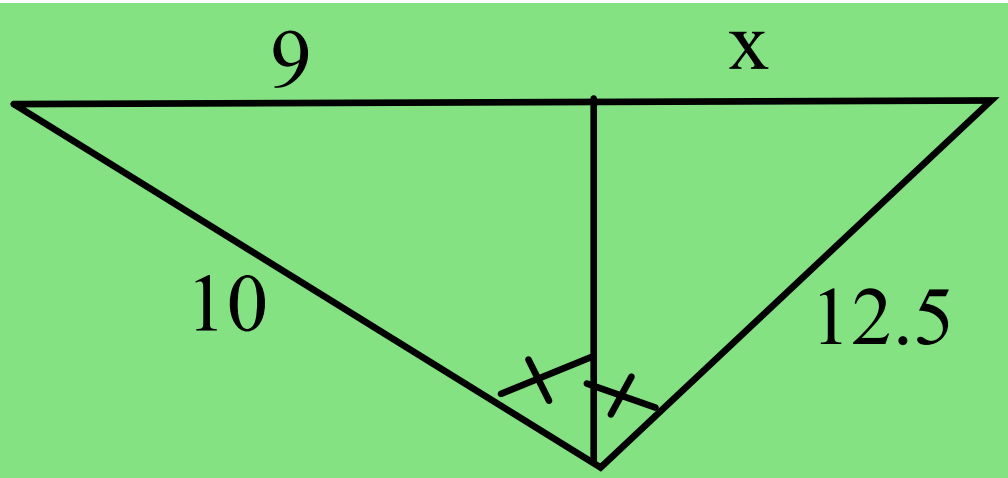
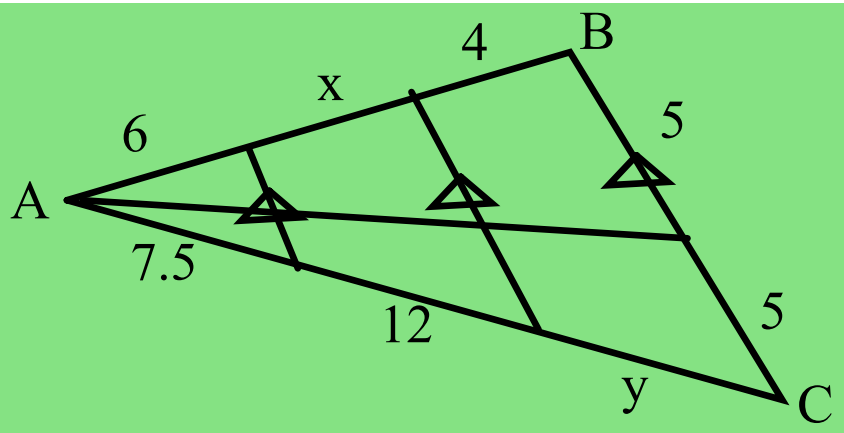
Solve for x in each diagram.




16
14
x
21


9
x
10
12.5



Find x.

Find y.