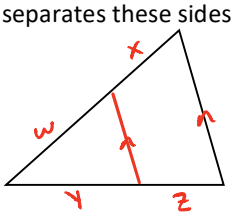
Similarity – Parallel Lines & Proportional Parts

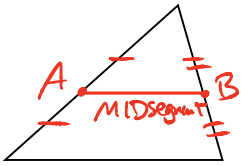
Notes Section 7.4 Name_____

Triangle Proportionality: A line, that intersects two sides of a triangle in two distinct points, is parallel to the third side IFF it separates these sides into segments of proportional lengths.

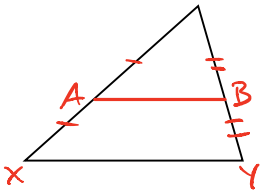


$\Leftrightarrow \quad \frac{w}{y} = \frac{x}{z}$

Midsegment: A segment in a triangle with endpoints that are the midpoints of two sides of the triangle.



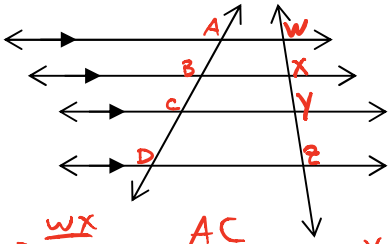
Theorem 7-6: A midsegment is parallel to the third side of the triangle and its length is one-half the length of the third side.



$\text{Midsegment} = \frac{1}{2} XY$

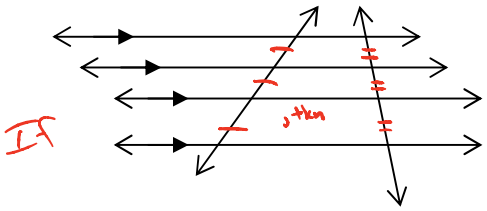
$AB = \frac{1}{2} XY$

Corollary 7-1: If three or more parallel lines intersect two transversals, then they cut off the transversals proportionally.

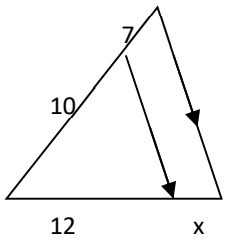


$\frac{AB}{BC} = \frac{WX}{XY}$ $\quad \frac{AC}{CD} = \frac{WY}{YZ}$

Corollary 7-2: If three or more parallel lines cut off congruent segments on one transversal then they cut off congruent segments on every transversal.



#1) Find the value of x.



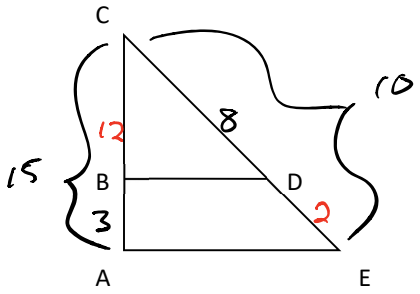
$\frac{10}{12} = \frac{7}{x}$

$(6x)\frac{5}{6} = \frac{7}{x}(6x)$

$5x = 42$

$x = \frac{42}{5}$

#2) Determine if $\overline{BD} \parallel \overline{AE}$. CA = 15, AB = 3, CD = 8, CE = 10



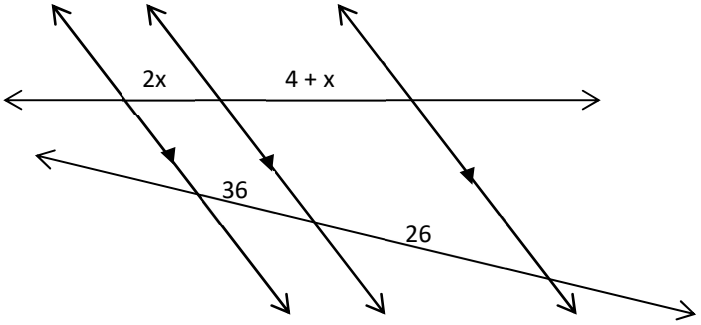
$\frac{12}{3} \stackrel{?}{=} \frac{8}{2}$

$4 = 4 \quad \therefore \overline{BD} \parallel \overline{AE}$

Similarity – Parallel Lines & Proportional Parts

Notes Section 7.4 Name_____

#3) Find the value of x.



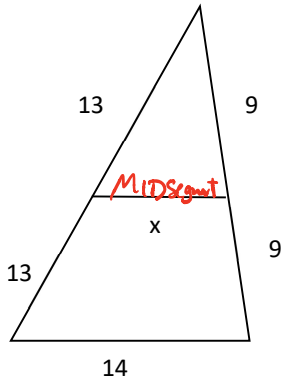
$\frac{2x}{36} = \frac{4+x}{26}$

$52x = 144 + 36x$

$16x = 144$

$x = 9$

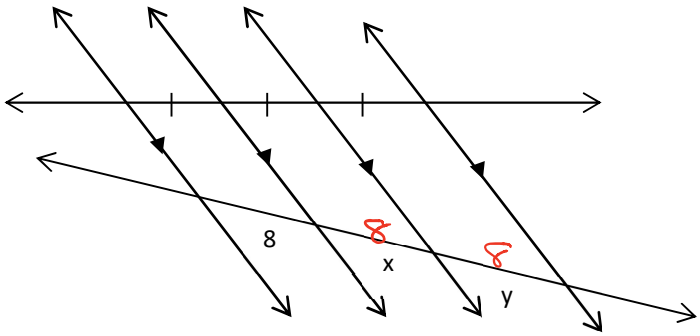
#4) Find the value of x.



$x = \frac{1}{2}(14)$

$x = 7$

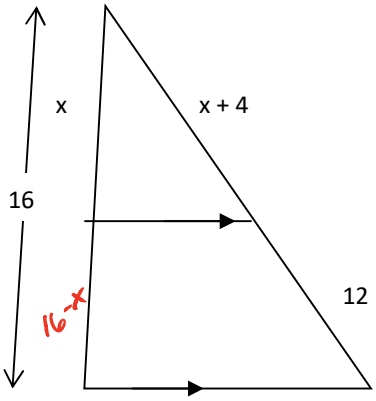
#5) Find the value of x and y.



$x = 8$

$y = 8$

#6) Find the value of x.



$\frac{x}{16-x} = \frac{x+4}{12}$

$12x = (x+4)(16-x)$

$12x = 16x + 64 - 4x - x^2$

$12x = -x^2 + 12x + 64$

$0 = -x^2 + 64$

$x^2 = 64$

$x = \pm 8$

$x \neq -8$, so $x = 8$