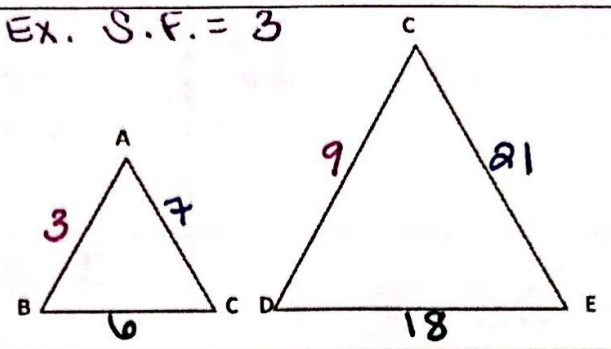
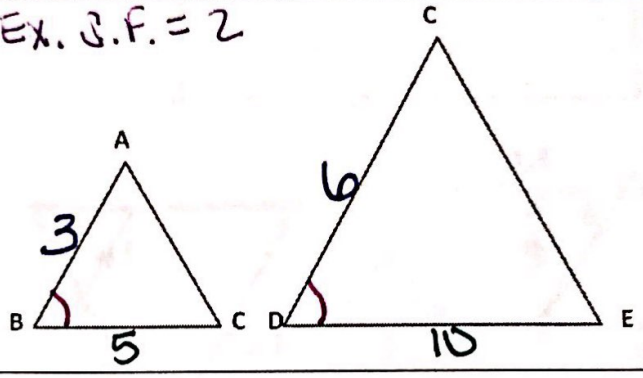
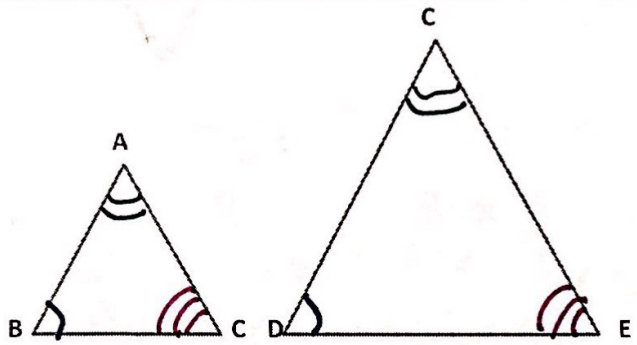
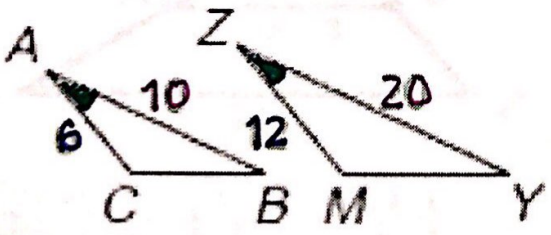
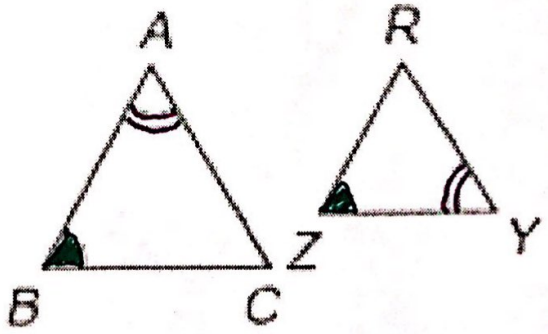
Triangle Similarity: When triangles are dilated, we prove they are similar in three ways:

PROOF	EXPLANATION	PICTURE
Side-Side-Side-	All three corresponding sides of two triangles are proportional.	Ex. S.F. = 3 
Side-angle-side	Two of the three corresponding sides of two triangle are proportional and the angle between them is congruent.	Ex. S.F. = 2 
Angle-Angle-Angle	All three corresponding angles of two triangles are congruent.	

Are these sets of triangles similar? If so, how?



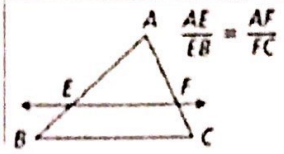
Yes, $\Delta ACB \sim \Delta ZMY$ by SAS



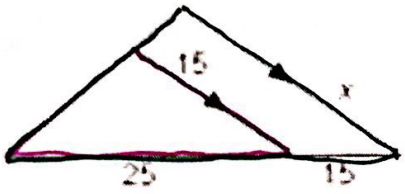
Yes, $\Delta ABC \sim \Delta YZR$ by AAA

G.SRT.3 Similarity Theorems

Triangle Proportionality Theorem: When the corresponding sides of two triangles are parallel to each other, a proportional relationship occurs with the remaining two side.

THEOREM	PICTURE	CONCLUSION
If a line parallel to a side of a triangle intersects the other two sides, then it divides those sides proportionally.		$\frac{AE}{EB} = \frac{AF}{FC}$
If a line divides two sides of a triangle proportionally, then it is parallel to the third side.		$\overline{EF} \parallel \overline{BC}$

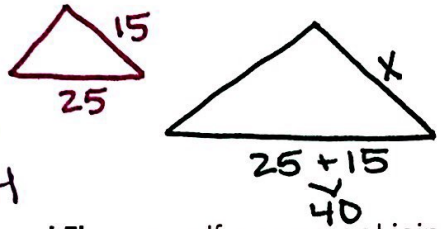
Solve for the missing pieces.

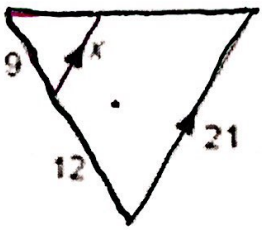


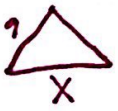
$\frac{25}{40} = \frac{15}{x}$

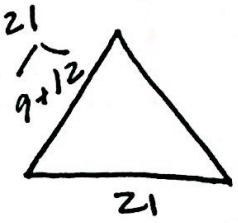
$25x = 600$

$x = 24$









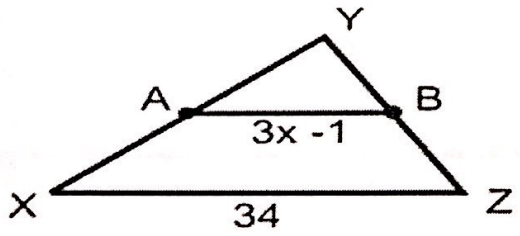
$\frac{9}{21} = \frac{x}{21}$

$9 \cdot 21 = 21x$

$189 = 21x$

$x = 9$

Mid-Segment Theorem: If a segment joins the midpoints of two sides of a triangle, then the segment is parallel to the third side, and is half its length.



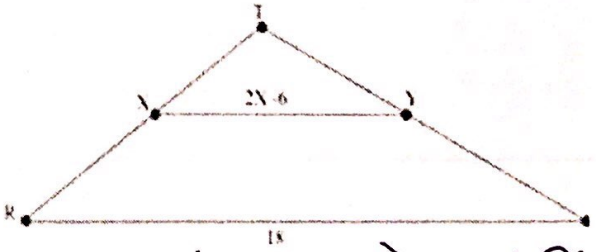
$2(3x-1) = 34$

$6x - 2 = 34$

$6x = 36$

$x = 6$

$\overline{AB} = 17$



$2(2x-6) = 18$

$4x - 12 = 18$

$4x = 30$

$x = 7.5$

$\overline{XY} = 9$