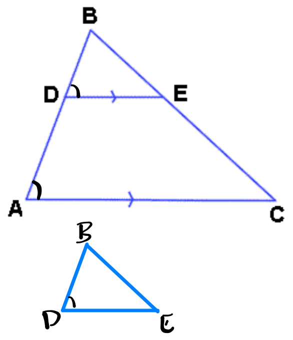
Dealing with OVERLAPPING TRIANGLES



Many problems involving similar triangles have one triangle ON TOP OF (overlapping) another triangle.

Here we have ΔBDE and ΔBAC

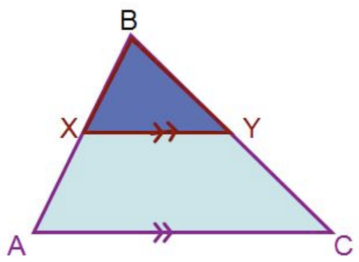
In this case line segments DE and AC are shown to be parallel--note the arrows on the line segments.

so,
we know that $<BDE$ is congruent to $<DAC$ (by corresponding angles).

$<B$ is shared by both triangles

so the two triangles are similar by AA

Parallel Line to a Triangle's Side: Any line parallel to a triangle's side determines two similar triangles.

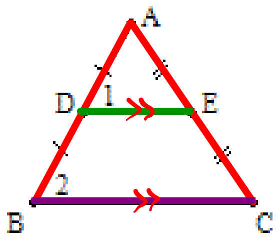


$\Delta BXY \quad \Delta BAC$

angles are congruent
sides are proportional

Corollary: Any two similar triangle determine parallel lines.

Segment Joining the Midpoints of Two Sides in a Triangle: Any segment joining the midpoints of two sides in a triangle is parallel to the third side and is half the measure of this third side.



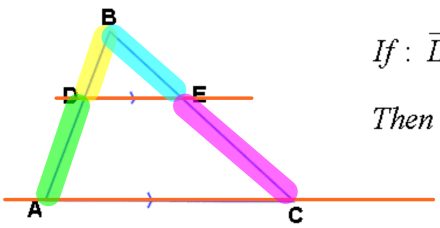
In triangle ABC

If: AD = DB, AE = EC

Then: DE // BC

$\overline{DE} = \frac{1}{2}\overline{BC}$

Thales' Theorem: Two intersecting transversal lines intersected by parallel lines are separated into corresponding segments of proportional length.



$If: \overline{DE} \parallel \overline{AC}$

$Then: \frac{BD}{DA} = \frac{BE}{EC}$