

Similar Triangles II

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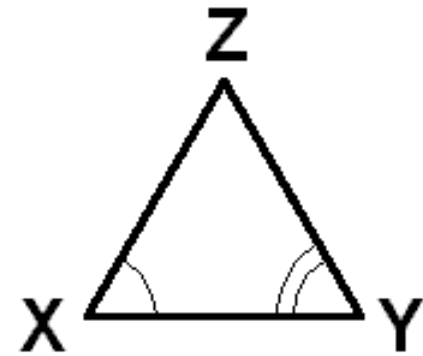
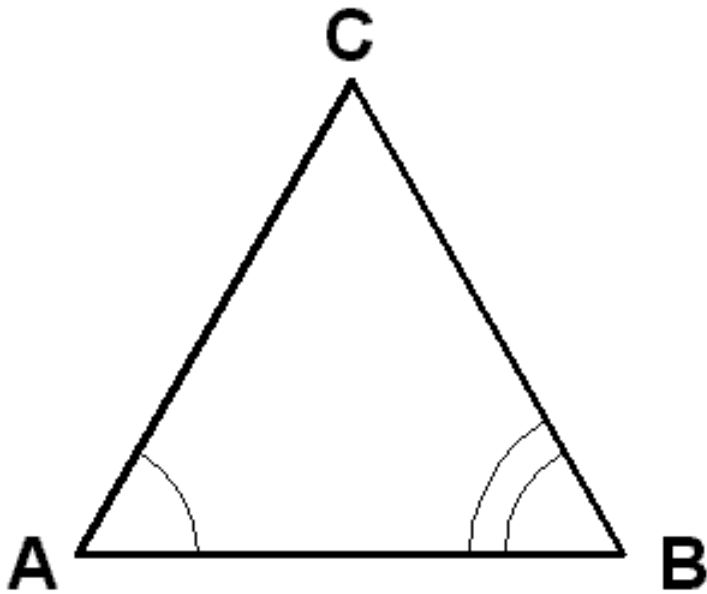
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Mathematicians have been able to show that two triangles, under certain conditions, are similar. Consider the following. . .

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If two pairs of corresponding angles are
congruent

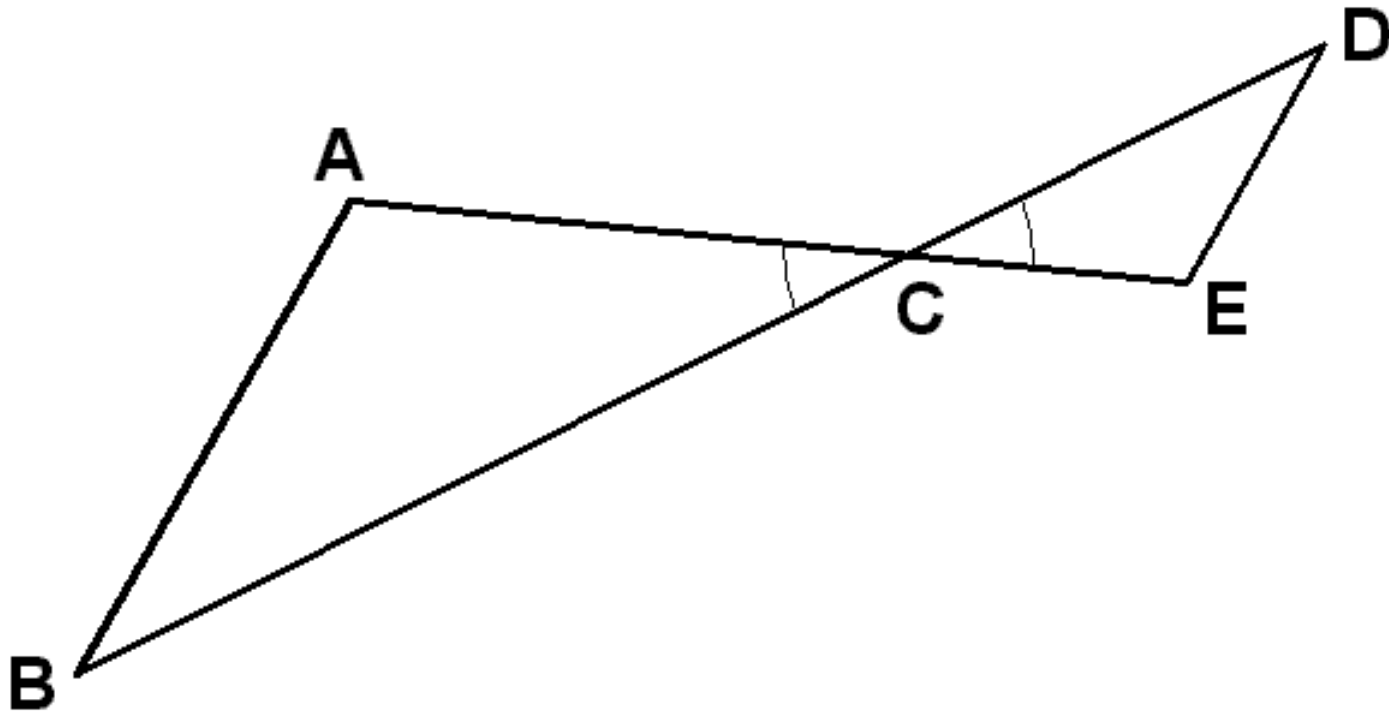
$$(\angle A \cong \angle X \text{ and } \angle B \cong \angle Y)$$

Then $\triangle ABC$ and $\triangle XYZ$ are similar.

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If two vertical angles and a pair of corresponding sides opposite the angles are parallel ($\overline{AB} \parallel \overline{DE}$), then $\triangle ABC$ and $\triangle DCE$ are similar.

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The following situations have to do with using transversals to create similar triangles.

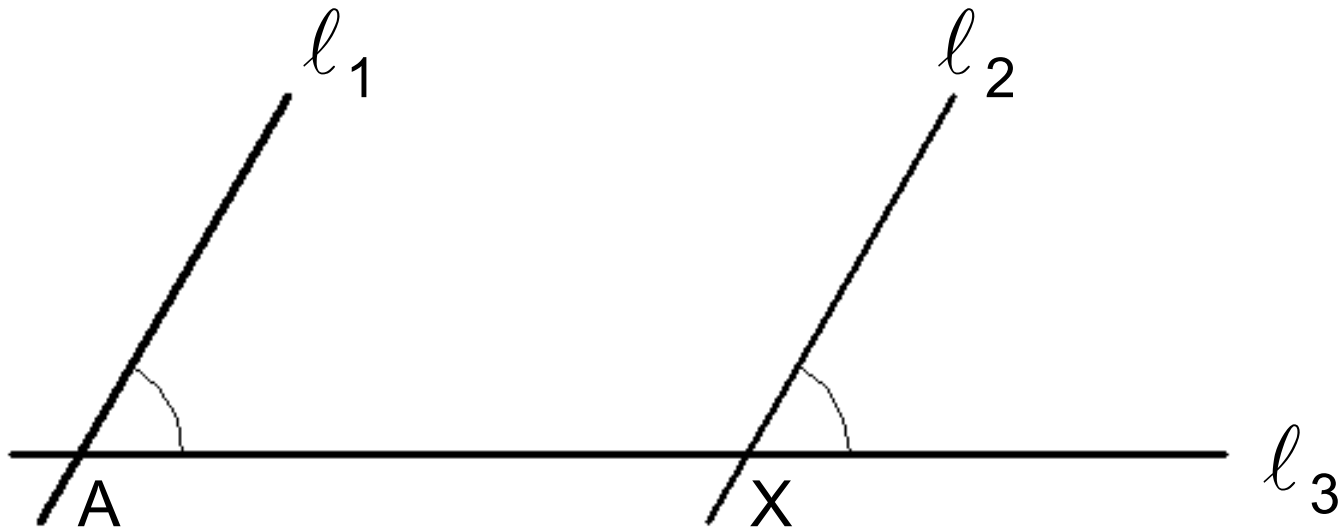
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l_3 is a transversal

$l_1 \parallel l_2$

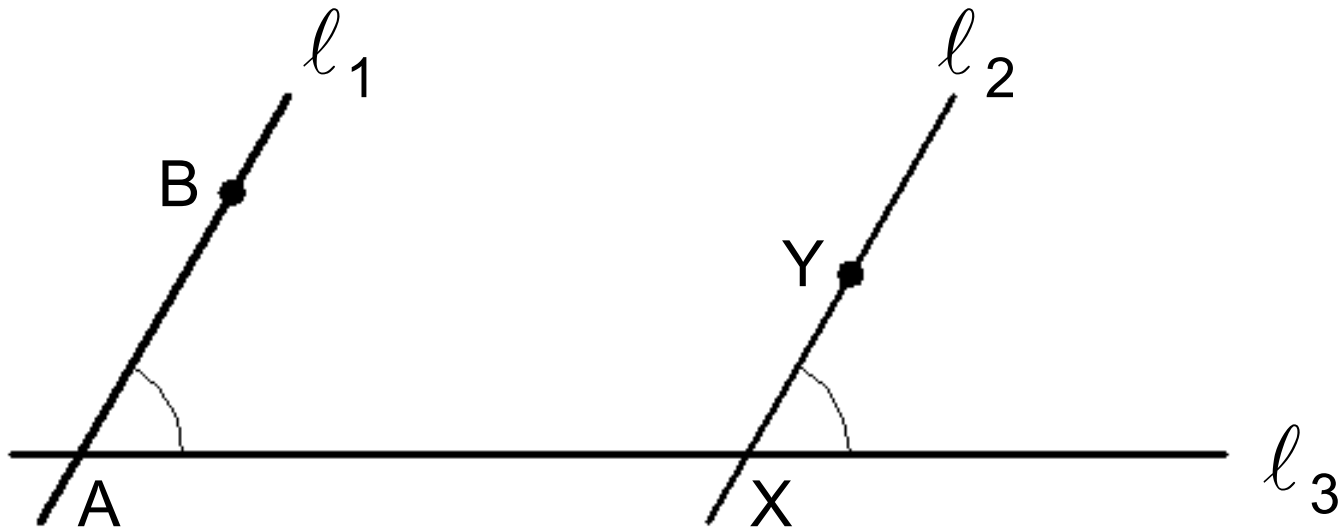


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Now, choose a point B on l_1 and a point Y on l_2 .

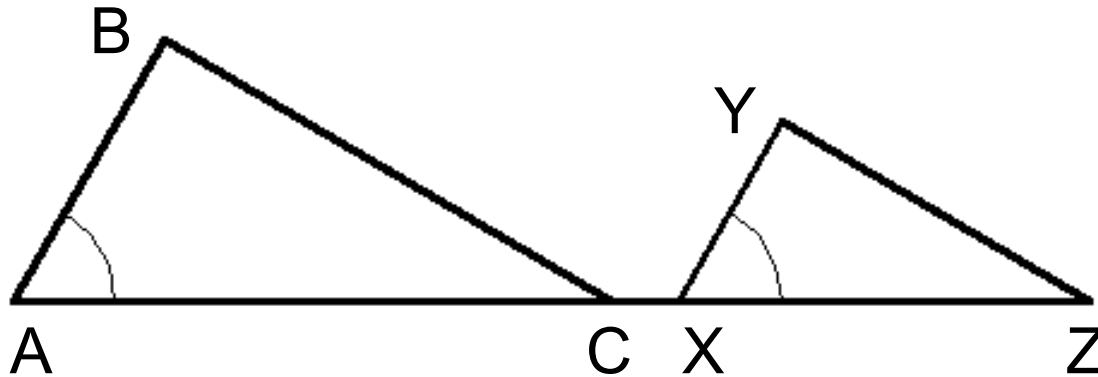


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Choose point C and Z on ℓ_3 . Draw a line from B to C and a line through Y that is parallel to \overline{BC} .



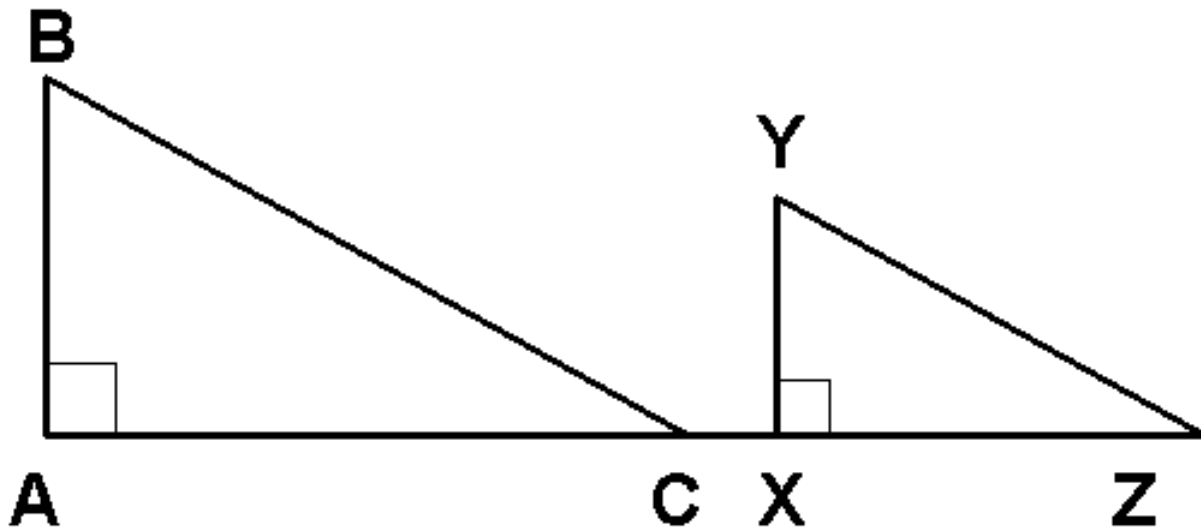
Note - If $\angle A \cong \angle X$ and $\overline{BC} \parallel \overline{YZ}$
 $\triangle ABC$ and $\triangle XYZ$ are similar.

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Q: Are the following triangles similar if $\overline{BX} \parallel \overline{YZ}$?



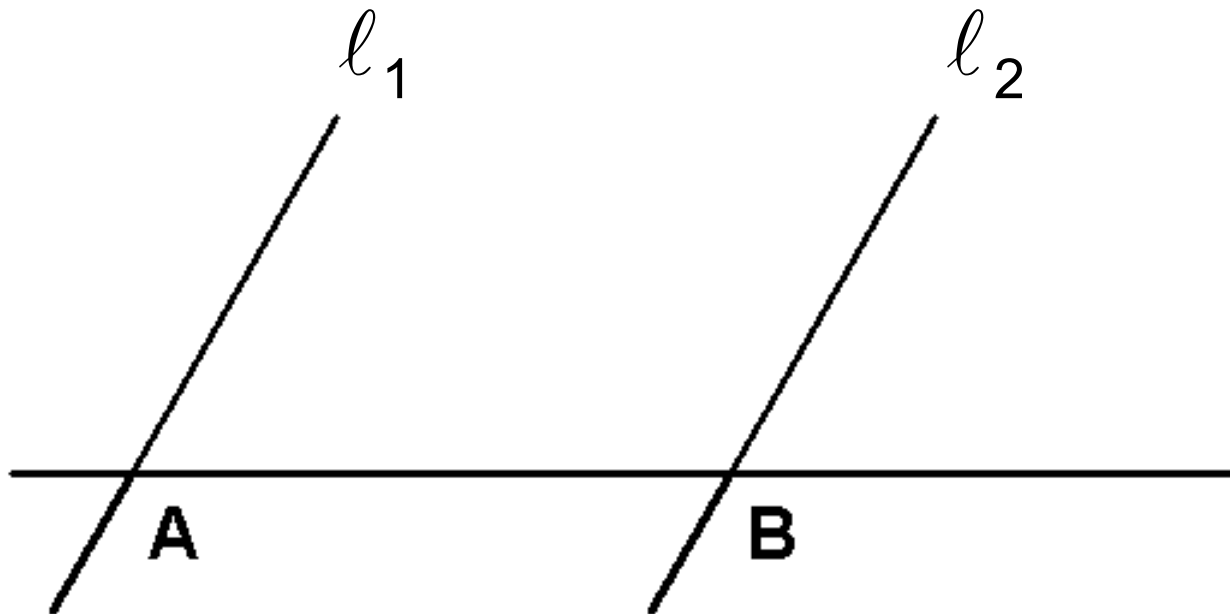
Answer-- Yes, don't discriminate against right triangles!

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Consider another transversal,

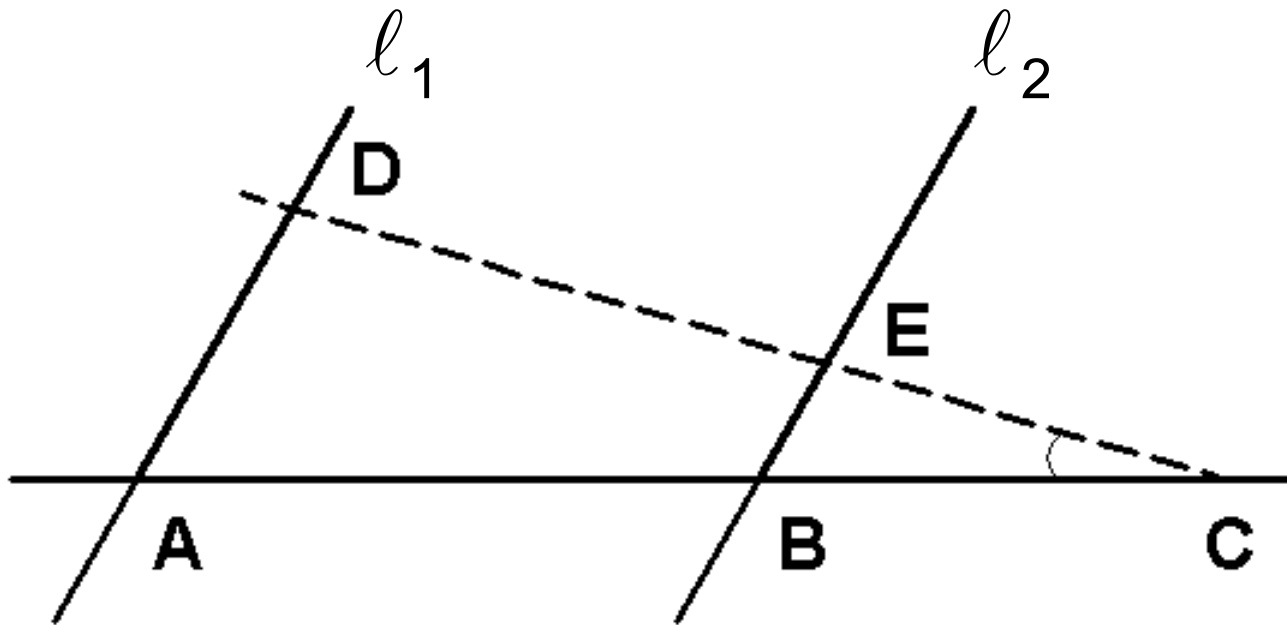


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Now,



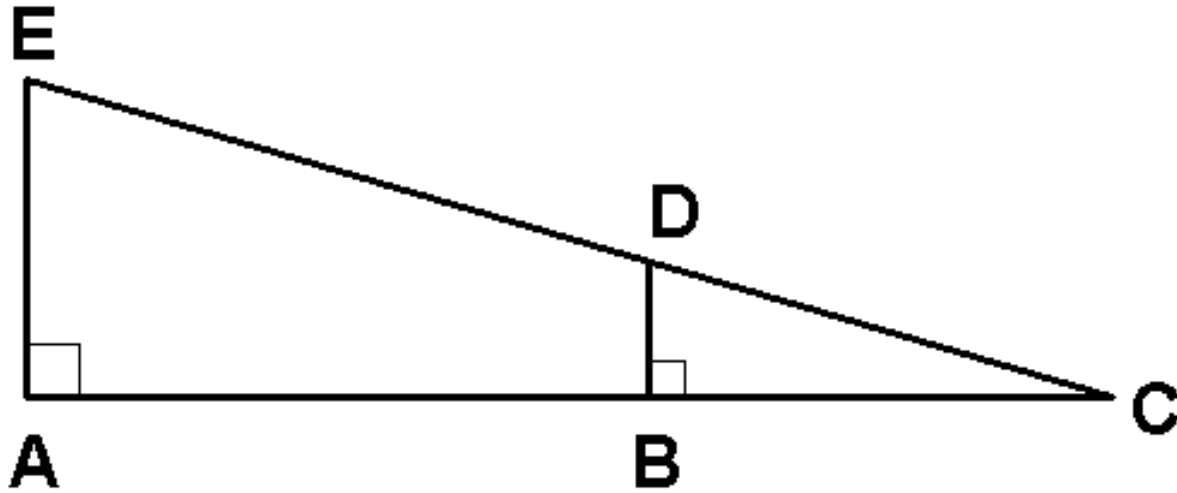
$\triangle ADC$ and $\triangle BEC$ are similar.

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Q: Are $\triangle ACE$ and $\triangle BCD$ similar?

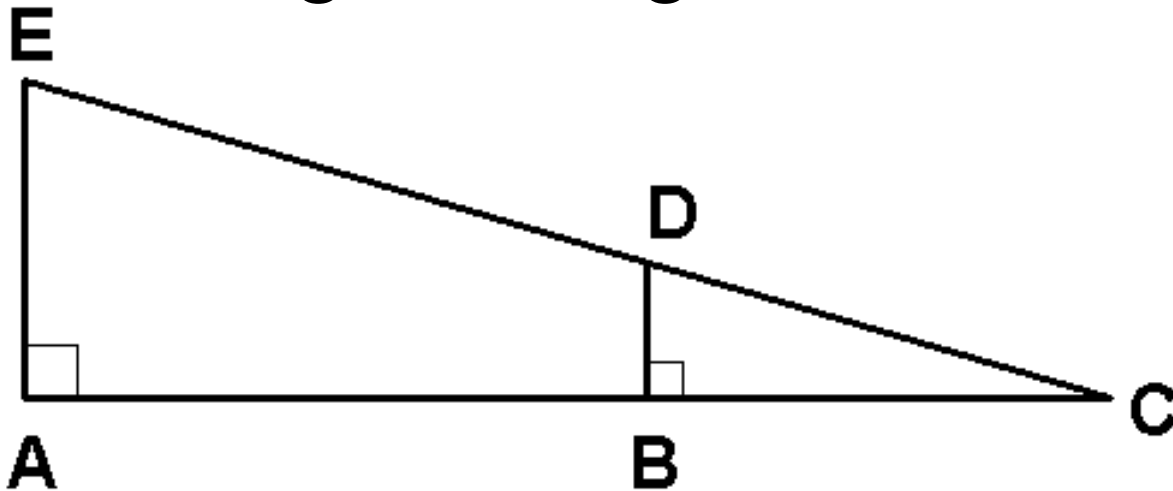


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Answer--Yes, don't discriminate against right triangles!



$\angle BCD \cong \angle ACE$ and $\overline{EA} \parallel \overline{DB}$.

Therefore, $\triangle ACE$ is similar to $\triangle BCD$.

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End of Similar Triangles II

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