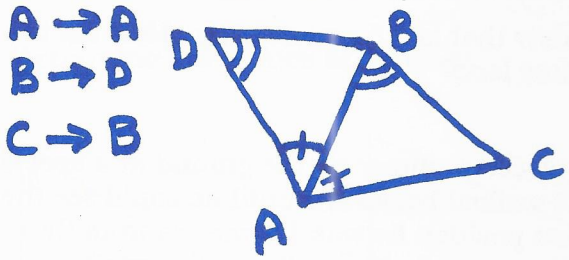
MPM2DG

Similar Triangles.

Example 1: A pair of similar triangles is given: $\Delta ABC \sim \Delta ADB$. The lengths of the sides are such that AC = 4, and AD = 9. What is the length of AB? (Answer: 6)



Remark! there are two algebraic solutions: $AB^2 = 36$

$AB^2 - 36 = 0, (AB-6)(AB+6)=0$

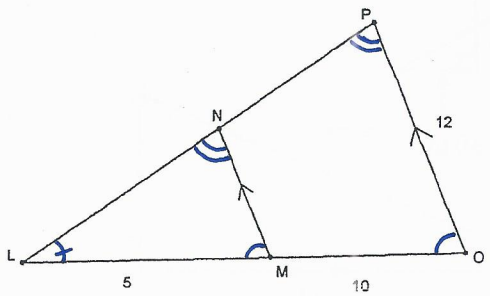
$\rightarrow AB-6=0$ or $AB+6=0$

$\frac{AB}{AD} = \frac{BC}{DB} = \frac{AC}{AB} \rightarrow \frac{AB}{AD} = \frac{AC}{AB} \rightarrow AB^2 = (AC)(AD)$ $\rightarrow AB=6$ or $AB=-6$

$AB^2 = (4)(9), \quad AB^2 = 36, \quad AB = \pm\sqrt{36}, \quad AB > 0$

$\rightarrow AB = 6$

Example 2: In figure below, MN is parallel to OP. The lengths are such that OP = 12, MO = 10, and LM = 5. Find MN. (Answer: 4)



$MN \| OP$

$\angle LMN = \angle LOP$ (corresponding angles)

$\angle LNM = \angle LPO$ (corresponding angles)

$\angle NLM = \angle PLO$ (shared)

$\therefore \Delta NML \sim \Delta POL$

$L \rightarrow L$
$N \rightarrow P$
$M \rightarrow O$

$\frac{LM}{LO} = \frac{MN}{OP} = \frac{LN}{LP}$

$\frac{MN}{12} = \frac{5}{LR} = \frac{5}{5+10}$

$(MN)(15) = (5)(12)$

$15MN = 60$

$MN = \frac{60}{15}$

$MN = 4$