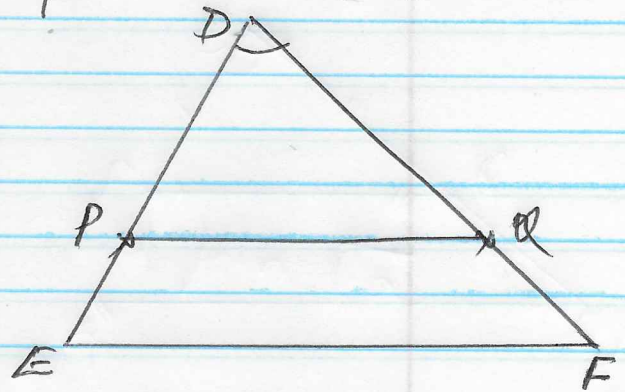
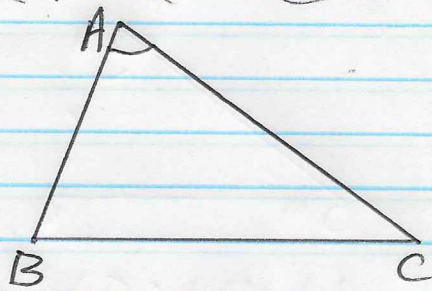


## Side-Angle-Side Similarity Theorem (SAS $\sim$ )



Given:  $\angle A = \angle D$

$$\frac{AB}{DE} = \frac{AC}{DF} \quad \text{--- (1) To prove: } \frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$$

Const:  $DP = AB$ ;  $DQ = AC$  and join  $PQ$   $\angle B = \angle E$ ;  $\angle C = \angle F$

Proof: Replace  $AB$  by  $DP$  and  $AC$  by  $DQ$  in eqn (1)

$$\frac{DP}{DE} = \frac{DQ}{DF} \Rightarrow \frac{DE}{DP} = \frac{DF}{DQ}$$

Subtract 1 from both sides

$$\frac{DE}{DP} - 1 = \frac{DF}{DQ} - 1 \Rightarrow \frac{DE - DP}{DP} = \frac{DF - DQ}{DQ}$$

$$\frac{PE}{DP} = \frac{QF}{DQ}$$

Now by converse of

BPT,  $PQ \parallel EF$

$$\therefore \angle P = \angle E; \angle Q = \angle F$$

ie  $\underline{\underline{\angle B = \angle E}}$  and  $\underline{\underline{\angle C = \angle F}}$

Now  $\underline{\underline{\triangle ABC \sim \triangle DEF}}$  (by AA $\sim$ )