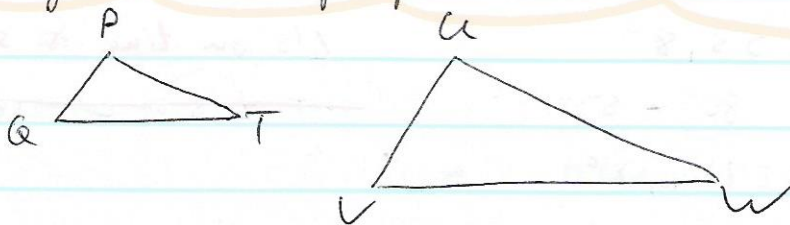


Triangles with proportional sides are equiangular.



$$\text{IF } \frac{PQ}{uv} = \frac{PT}{uw} = \frac{QT}{vw}$$

$$\Rightarrow \triangle PQT \parallel \triangle uvw.$$

Self study: p231 Proof.

eg p233 Ex 5: 5

5.1) In $\triangle ABE$ and $\triangle CDE$

$$1. \frac{AB}{CD} = \frac{5}{20} = \frac{1}{4}$$

$$2. \frac{BE}{DE} = \frac{6}{24} = \frac{1}{4}$$

$$3. \frac{AE}{CE} = \frac{4}{16} = \frac{1}{4}$$

$$\therefore \frac{AB}{CD} = \frac{BE}{DE} = \frac{AE}{CE} = \frac{1}{4}$$

$\therefore \triangle ABE \parallel \triangle CDE$ (Sides in proportion)

$$5.2) \hat{A} = \hat{C} \quad (\Delta ABE \parallel \Delta CDE)$$

$$\therefore AB \parallel CD \quad (\text{alternate } \angle\text{'s are } =)$$

$$5.3) (1) e^2 = a^2 + b^2 - 2ab \cos \hat{E}$$

$$5^2 = 6^2 + 4^2 - 2(6)(4) \cos \hat{E}$$

$$\therefore \cos \hat{E} = \frac{5^2 - 6^2 - 4^2}{-2(6)(4)}$$

$$= \frac{9}{16}$$

$$\therefore \hat{AEB} = 55,8^\circ$$

$$\therefore \hat{BEC} = 180^\circ - 55,8^\circ$$

$$= 124,2^\circ$$

Use cos rule as you have 3 sides

\angle 's on line is suppl.

(~~int \angle 's of $\Delta = 180^\circ$)~~)

~~Sin \hat{E}~~ In ΔBCE is

$$e^2 = b^2 + c^2 - 2bc \cos \hat{E}$$

$$= 16^2 + 6^2 - 2(16)(6) \cos 124,2^\circ$$

$$\approx 400$$

$$\therefore e = 20 \rightarrow$$

(2) In ΔADE is:

$$e^2 = a^2 + d^2 - 2ad \cos \hat{E}$$

$$= 4^2 + 24^2 - 2(24)(4) \cos 124,2^\circ$$

$$= 592 - 192 \cos 124,2^\circ$$

In ΔEBC and ΔEAD is

$$\frac{EB}{EA} = \frac{EC}{EA} = \frac{6}{4} = \frac{3}{2}$$

$$\frac{EC}{ED} = \frac{16}{26,5}$$

5.3.2. In $\triangle ADE$ is:

$$\begin{aligned}e^2 &= a^2 + d^2 - 2ad \cos \hat{E} \\&= 4^2 + 24^2 - 2(24)(4) \cos 124,2^\circ \\&= 592 - 192 \left(\frac{-9}{16} \right) \\&= 700\end{aligned}$$

$$\therefore e = 10\sqrt{7}$$

5.4

$$\frac{AE}{CE} = \frac{4}{16} = \frac{1}{4}$$
$$\frac{ED}{EB} = \frac{24}{24} = 1$$

In $\triangle AED$ and $\triangle BEC$ is

$$\frac{AE}{BE} = \frac{4}{6} = \frac{2}{3}$$

$$\frac{ED}{EC} = \frac{24}{16} = \frac{3}{2}$$

Sides are not in proportion.

$\therefore \triangle AED \not\sim \triangle BEC$