01 In ΔABC, $\angle A + \angle B = 84°$ and $\angle B + \angle C = 146°$ then find the smallest side of ΔABC.

Given $\angle A + \angle B = 84°$ and $\angle B + \angle C = 146°$

$\angle A + \angle B + \angle B + \angle C = 84° + 146° = 230°$

$\angle A + \angle B + \angle C + \angle B = 230°$

$180° + \angle B = 230°$

$\angle B = 50°$

$\angle A + 50° = 84° \Rightarrow \angle A = 34°$

$50° + \angle C = 146° \Rightarrow \angle C = 96°$

$\angle A$ is smallest angle

$\Rightarrow$ BC is smallest side

02 In ΔABC, $\angle B = 5\angle C$ and $\angle A = \frac{6}{5}\angle B$ then $\angle A - 90° = ?$

Given $\angle B = 5\angle C$

$$\angle A = \frac{6}{5}\angle B = \frac{6}{5} \times 5\angle C = 6\angle C$$

$\angle A + \angle B + \angle C = 180°$

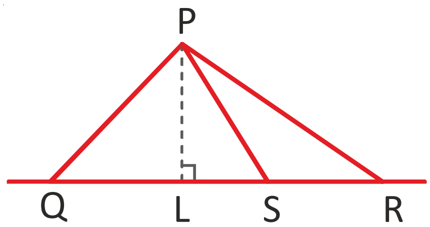
$6\angle C + 5\angle C + \angle C = 180°$

$12\angle C = 180°$

$\angle C = 15°$

$\angle A - 90° = 6\angle C - 90° = 90° - 90° = 0$

03 In the figure, $PL \perp QR$; $\angle Q = \angle S$ and $\angle R > \angle Q$, then find the relation between PR & PQ.



$\Delta PQL \cong \Delta PSQ$ [$\because$ SAS congruency]

$\therefore \angle Q = \angle PSL$ .... (1)

$\angle PSL > \angle R$ .... (2)

from (1) & (2) $\angle Q > \angle R$

$\Rightarrow PR > PQ$

04 In ΔABC, $\angle B = 90°$ and $BD \perp AC$. Define the relationship among all the three triangles.

Given in ΔABC, $\angle B = 90°$ $\angle A + \angle 90° + \angle C = 180°$

$\angle C = 90° - \angle A$

$\therefore$ Three angles of ΔABC are $\angle A$, $90°$, $90° - \angle A$

Given $BD \perp AC$

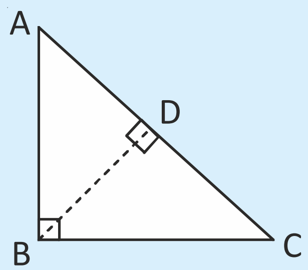
In ΔABD, $\angle A + 90° + \angle ABD = 180°$

$\angle ABD = 90° - \angle A$

Three angles of ΔABD are $\angle A$, $90°$ & $90° - \angle A$

Similarly we can prove three angles of ΔBCD are $\angle A$, $90°$, $90° - \angle A$

$\therefore$ Three triangles are equiangular i.e., three triangles are similar



05 In ΔABC, $30\angle A = 6\angle B = 5\angle C$ then find the exterior angle of $\angle A$.

Given $30\angle A = 6\angle B = 5\angle C = k$, (let)

$\angle A = \frac{k}{30}, \angle B = \frac{k}{6}, C = \frac{k}{5}$

But $\angle A + \angle B + \angle C = 180°$

$$\frac{k}{30}+\frac{k}{6}+\frac{k}{5}=180^\circ$$

$$\frac{k+5k+6k}{30}=180^\circ$$

$12k = 180° \times 30$

$k = 450°$

$$\therefore \angle A=\frac{k}{30}=\frac{450^\circ}{30}=15^\circ$$

Exterior angle of $\angle A = 180° - \angle A = 165°$