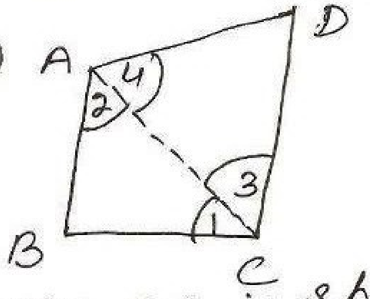
math.com

ex 7.4

(4)



given AB is shortest, CD is longest side

to prove $\angle A > \angle C$, $\angle B > \angle D$

const - join AC

Proof - In $\triangle ABC$

$BC > AB$

$\Rightarrow \angle 2 > \angle 1 \quad \ldots (i)$

In $\triangle ACD$

$CD > AD$

$\Rightarrow \angle 4 > \angle 3 \quad \ldots (ii)$

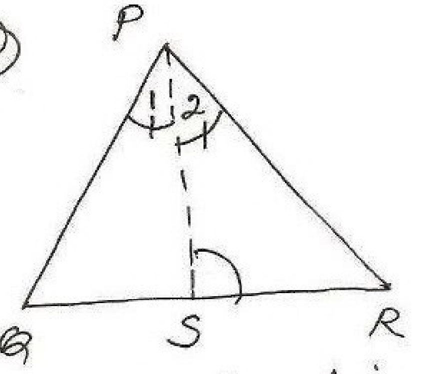
(i) + (ii)

$\angle 2 + \angle 4 > \angle 1 + \angle 3$

$\angle A > \angle C$

Sim. $\angle B > \angle D$

(5)



given - In fig. $PR > PQ$, PS bisects $\angle QPR$

to prove $\angle PSR > \angle PSQ$

Proof

In $\triangle PQR$

$PR > PQ$

$\angle Q > \angle R$

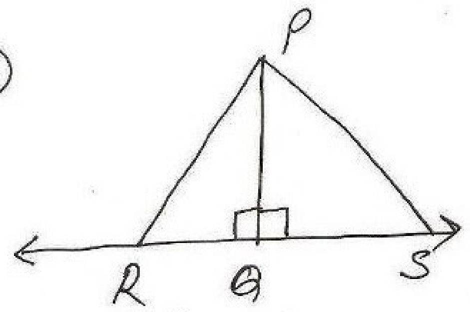
adding $\angle 1$ on both sides

$\angle Q + \angle 1 > \angle R + \angle 1$

$\angle PSR > \angle R + \angle 2 \quad (\because \angle 1 = \angle 2)$

$\angle PSR > \angle PSQ$ [exterior $\angle$ prop.]

(6)



to prove $PQ < PR$
$PQ < PS$

proof - In $\triangle PQR$,

$\angle Q = 90^\circ$

$\therefore PR > PQ$ [In a rt $\triangle$ hyp. is longest side]

$\Rightarrow PQ < PR$

Sim. $PQ < PS$