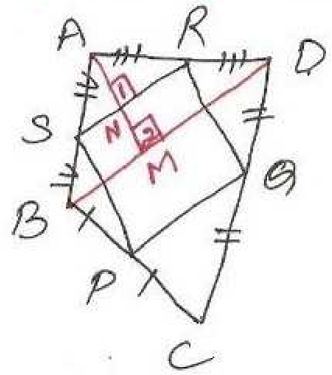
ex 9.3, exemplar IX

(9)



to prove

ar(||gm PQRS) = $\frac{1}{2}$ ar(□ABCD)

const - join BD,

draw AM ⊥ BD

proof - In △ABD

SR joins midpts of sides AB and AD resp.

SR = $\frac{1}{2}$ BD .. (i)

SR || BD ---(ii) (Midpt theorem)

Sim PQ = $\frac{1}{2}$ BD ... (iii)

PQ || BD ... (iv)

From (i), (iii) SR = PQ

From (ii), (iv) SR || PQ

□PQRS is a ||gm

In △AMB

S is midpt of AB

SN || BM

AN = NM (converse of midpt theorem)

But AM = AN + NM

= AN + AN

AM = 2AN --- (v)

∠1 = ∠2 = 90° (corres ∠s SR || BD)

$$\frac{ar(\triangle ABD)}{ar(\triangle ASR)} = \frac{\cancel{\frac{1}{2}} \times BD \times AM}{\cancel{\frac{1}{2}} \times SR \times AN}$$

$$= \frac{2\cancel{SR} \times 2\cancel{AN}}{\cancel{SR} \times \cancel{AN}}$$

$$= \frac{4}{1}$$

cont. on next page

NCERT Exemplar sols by Dev Anoop (Bathinda)