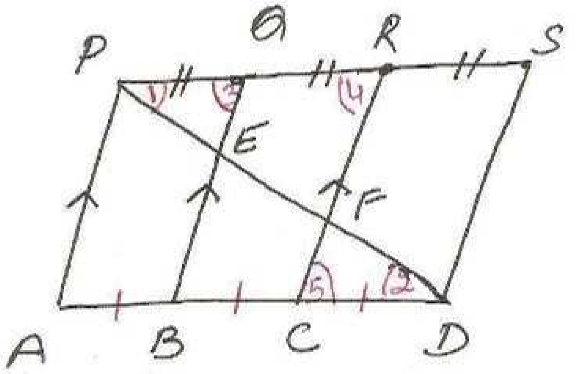
(1)



to prove

ar(△PQE) = ar(△CFD)

proof AP ∥ BQ ∥ CR

and

AP ∥ DS (opp. sides of ∥gm)

∴ AP ∥ BQ ∥ CR ∥ DS

PS and AD are transversals

and PQ = QR = RS ... (i)

⇒ AB = BC = CD ... (ii) [equal intercept theorem]

PSDA is a ∥gm

PS = AD (opp sides of ∥gm)

3PQ = 3CD (using i and ii)

⇒ PQ = CD

∠3 = ∠4 (corresponding)

But ∠4 = ∠5 (alternate interior angles)

∠3 = ∠5

In △PQE and △DCF

∠1 = ∠2 (alternate ∠s)

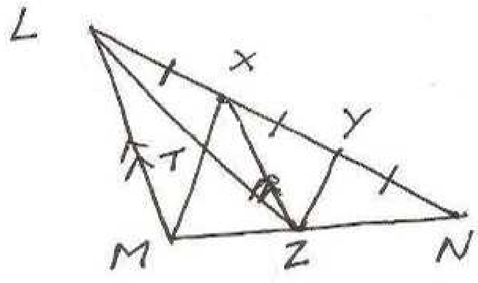
PQ = CD (proved)

∠3 = ∠5

∴ △PQE ≅ △DCF by ASA prop

⇒ ar(△PQE) = ar(△CFD)

(2)



to prove ar(LZY) = ar(MZYX)

proof

ar(△MZX) = ar(△LXZ) [△s on same base and between same ∥ lines]

Sub. ar(△XTZ) from both sides

ar(△MZX) − ar(△XTZ)

= ar(△LXZ) − ar(△XTZ)

⇒ ar(△MTZ) = ar(△LXT)

add. ar(□XTZY) on both sides

ar(MTZ) + ar(□XTZY)

= ar(△LXT) + ar(□XTZY)

⇒ ar(□MZYZ) = ar(△LXY)