Lines and Angles Ex 6.2

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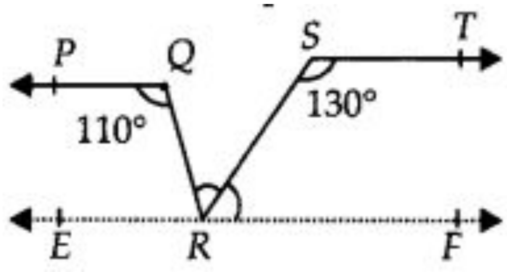
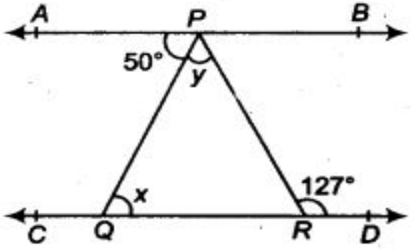
STUDY HUB

Question 4.
In figure, if PQ || ST, ∠ PQR = 110° and ∠ RST = 130°, find ∠QRS.



Solution:
Draw a line EF parallel to ST through R.
PQ || ST [Given]
and EF || ST [Construction]
∴ PQ || EF and QR is a transversal
⇒ ∠PQR = ∠QRF [Alternate interior angles]
∠PQR = 110° [Given]
∴∠QRF = ∠QRS + ∠SRF = 110° …(1)
ST || EF and RS is a transversal
∴ ∠RST + ∠SRF = 180° [Co-interior angles].
130° + ∠SRF = 180°
⇒ ∠SRF = 180° – 130° = 50°
from (1),.
∠QRS + 50° = 110°
⇒ ∠QRS = 110° – 50° = 60°
∠QRS = 60°.

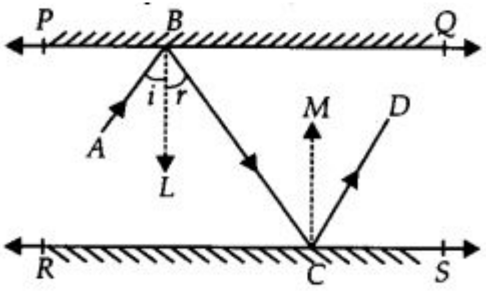
Question 5.
In figure, if AB || CD, ∠APQ = 50° and ∠PRD = 127°, find x and y.



Solution:
We have AB || CD and PQ is a transversal.
∴ ∠APQ = ∠PQR
[Alternate interior angles]

$50° = x$ [∵ ∠APQ = 50° (given)]
, AB || CD and PR is a transversal.
∴ ∠APR = ∠PRD [Alternate interior angles]
⇒ ∠APR = 127° [∵ ∠PRD = 127° (given)]
⇒ ∠APQ + ∠QPR = 127°
⇒ 50° + y = 127° [∵ ∠APQ = 50° (given)]
⇒ y = 127°- 50° = 77°
Thus, x = 50° and y = 77°.

Question 6.
In figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that AB || CD.



Solution:
Draw ray BL ⊥PQ and CM ⊥ RS

∵ PQ || RS ⇒ BL || CM
[∵ BL || PQ and CM || RS]
BL || CM and BC is a transversal.
∴ ∠LBC = ∠MCB …(1) [Alternate interior angles]
, angle of incidence = Angle of reflection
∠ABL = ∠LBC and ∠MCB = ∠MCD
⇒ ∠ABL = ∠MCD …(2) [By (1)]

Adding (1) and (2),
∠LBC + ∠ABL = ∠MCB + ∠MCD
⇒ ∠ABC = ∠BCD
i. e., a pair of alternate interior angles are equal.
∴ AB || CD.