SpeedLabs
MATHS

CBSE 9th

TEEVRA EDUTECH PVT. LTD.

LINES AND ANGLES

Exercise- 6.2

> SpeedLabs
Assisted Practice | Expert Guidance | Personalized Insights
"An Innovative Practice Methodology by IITians."

Q.1 In the given figure, find the values of x and y and then show that AB || CD.
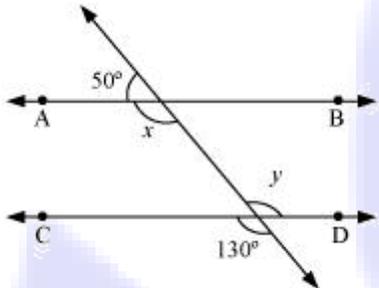
Ans. We need to find the value of x and y in the figure given below and then prove that AB || CD.

From the figure, we can conclude that

Y = 130° (Vertically opposite angles), and

X = 50° form a pair of linear pair.

We know that the sum of linear pair of angles is.

X + 50° = 180°
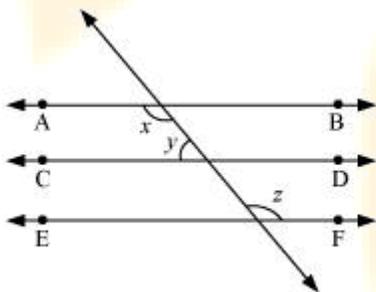
X = 130°

X = y = 130°

From the figure, we can conclude that x and y form a pair of alternate interior angles corresponding to the lines AB and CD.

Therefore, we can conclude that x = 130°, y = 130° and AB || CD.

Q.2 In the given figure, if AB || CD, CD || EF and y: z = 3: 7, find x.

Ans. We are given that AB|| CD || EF, and y : z =3: 7

We need to find the value of x in the figure given below.

We know that lines parallel to the same line are also parallel to each other.

We can conclude that AB || CD, CD || EF

Let. Y = 3a and z = 7a

We know that angles on same side of a transversal are supplementary.

∴ x + y = 180°

x = z (Alternate interior angles)

z + y = 180° , or

7a + 3a = 180°

⇒ 10a = 180°

a = 18°

z = 7a = 126°

y = 3a = 54°

Now x + 54° = 180°

x = 126°

Therefore, we can conclude that x = 126°

Q.3 In the given figure, If AB || CD, EF ⊥ CD and ∠GED find = 126° find ∠AGE, ∠GEF and ∠FGE
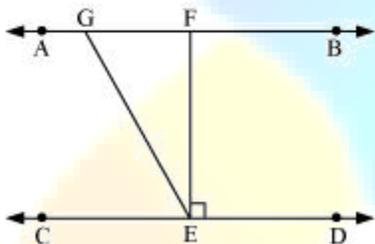
Ans. We are given that AB || CD, EF ⊥ CD and ∠GED = 126°

We need to find the value of ∠GED = ∠FED +∠GED, in the figure given below.

∠GED = 126°

∠GED = ∠FED +∠GEF

But, ∠FED = 90°

126° = 90° + ∠GEF

⟹ ∠AGE = ∠GED (Alternate angles)

∴ ∠AGE = 126°

From the given figure, we can conclude that ∠FED and ∠FEC form a linear pair.

We know that sum of the angles of a linear pair is 180°.

∠FEC = ∠GEF + ∠GEC

⟹ ∠GEC = 54° (Alternate interior angles)

Therefore, we can conclude that ∠AGE = 126° , ∠GEF = 36° and ∠FGE = 54°

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

[Hint: Draw a line parallel to ST through point R.]
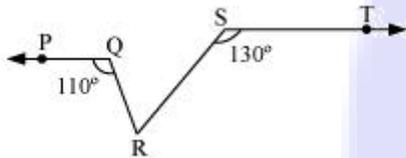
Ans. We are given that PQ || ST, ∠PQR = 110° and ∠ = 130°

We need to find the value of ∠QRS in the figure.
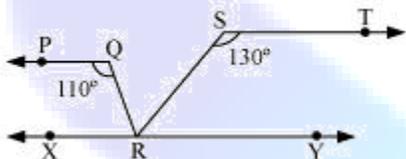
We need to draw a line RX that is parallel to the line ST, to get

Thus, we have ST || RX

We know that lines parallel to the same line are also parallel to each other.

We can conclude that PQ || ST || RX

∠PQR = ∠QRX, or (Alternate interior angles)

∠QRX = 110°

We know that angles on same side of a transversal are supplementary.

∠QRX = ∠SRX + ∠QRS ⟹ 110° = 50° ∠QRS

⟹ ∠QRS = 60°

Therefore, we can conclude that ∠QRS = 60°

Q.5 In the given figure, if AB || CD, ∠APQ = 50° and ∠PRD = 127° find x and y.
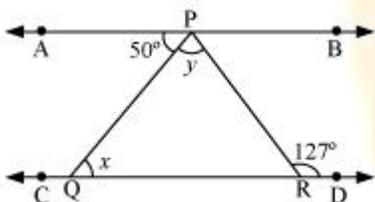
Ans. We are given that AB || CD, ∠APQ = 50° and ∠PRD = 127°

We need to find the value of x and y in the figure.

∠APQ = 50° (Alternate interior angles)

∠APR = ∠APR = 127° (Alternate interior angles)

∠APR = ∠QPR + ∠APQ

127° = y + 50°   ⟹ y = 77°

Therefore, we can conclude that x = 50° and y = 77°

Q.6 In the given 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.
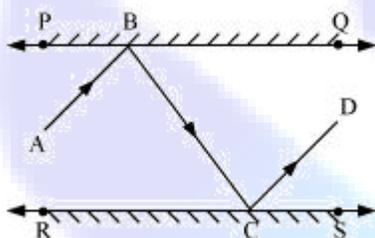
Ans. We are given that PQ and RS are two mirrors that are parallel to each other
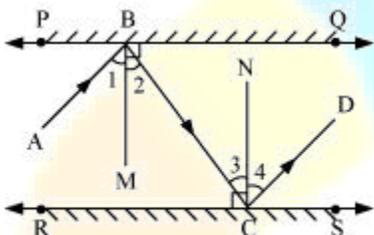
We need to prove that AB || CD in the figure.

Let us draw lines BX and CY that are parallel to each other, to get

We know that according to the laws of reflection

∠ABX = ∠CBX and ∠BCY = ∠DCY

∠BCY = ∠CBX (Alternate interior angles)

We can conclude that ∠ABX = ∠CBX = ∠BCY = ∠DCY

From the figure, we can conclude that

∠ABC = ∠ABX + ∠CBX, and ∠DCB = ∠BCY = ∠DCY

Therefore, we can conclude that ∠ABC = ∠DCB

From the figure, we can conclude that ∠ABC and ∠DCB form a pair of alternate interior angles

corresponding to the lines AB and CD, and transversal BC.

Therefore, we can conclude that AB || CD