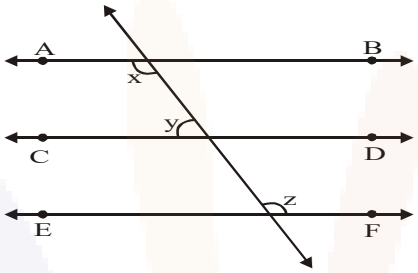
CLASS IX: MATHS
Chapter 6: Lines And Angles

Questions and Solutions | Exercise 6.2 - NCERT Books

Q1. In figure, if AB || CD, CD || EF and y : z = 3 : 7, find x.



Sol. AB∥CD and CD∥EF

$\Rightarrow$ AB∥EF

$\Rightarrow$ x = z (Alternate angles)

Now, x + y = 180°

(Pair of interior angles on the same side of the transversal)

$\Rightarrow$ z + y = 180° i.e, y + z = 180°

Also, we are given that, y : z = 3 : 7

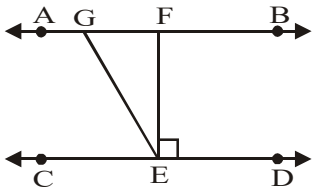
Then, $y = \frac{3}{10} \times 180° = 54°$

and $z = \frac{7}{10} \times 180° = 126°$

We have x = z = 126°

Therefore, x = 126°

Q2. In figure, if AB || CD, FE $\perp$ CD and $\angle GED = 126°$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$.

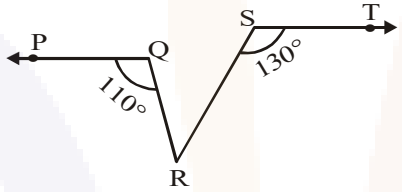


Sol. AB∥CD [given]

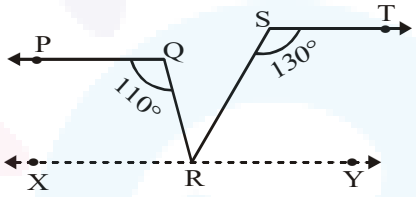
$\angle AGE = \angle GED = 126°$ [Alternate angles]

$\Rightarrow \angle GEF + 90° = 126°$
$\angle GEF = 36°$
$\angle GEC + \angle GEF + \angle FED = 180°$ [Straight line]
$\angle GEC + 126° = 180°$
$\angle GEC = 180° - 126° = 54°$
$\angle FGE = \angle GEC = 54°$ [Alternate angles]

Q3. In figure, if PQ || ST, $\angle PQR = 110°$ and $\angle RST = 130°$, find $\angle QRS$.

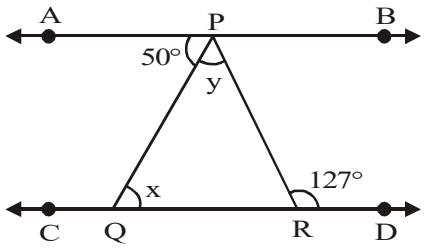


Sol. Through R, we draw XRY || PQ.



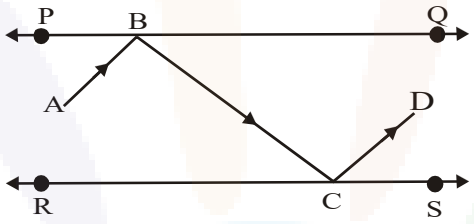
$\Rightarrow$ XRY || ST ($\because$ PR || ST)
$\angle QRX + 110° = 180°$
and $\angle YRS + 130° = 180°$
$\Rightarrow \angle QRX = 70°$
and $\angle YRS = 50°$
Now, $\angle QRX + \angle QRS + \angle YRS = 180°$
$\Rightarrow 70° + \angle QRS + 50° = 180°$
$\Rightarrow \angle QRS = 60°$

Q4. In figure, if AB || CD, $\angle APQ = 50°$ and $\angle PRD = 127°$, find x and y.

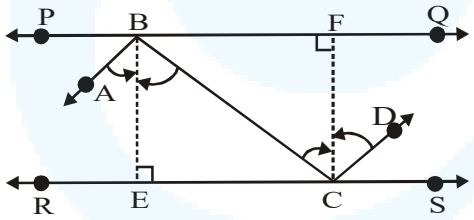


Sol. AB||CD [given]
x = ∠APQ = 50° [Alternate angles]
∠APQ + y = ∠PRD = 127° [Alternate angles]
50° + y = 127°
y = 127° – 50° = 77°

Q5. 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.



Sol. We draw BE ⊥ RS, then BE is also ⊥ PQ
(∵ PQ || RS)
We draw CF ⊥ PQ. Here, also CF ⊥ RS



Here, if we consider PQ as transversal intersecting lines BE and CF, then each pair of corresponding angles is equal. (each equal to 90°)
Thus, we have BE || CF.
Now, ∠ABE = ∠CBE
(Angle of incidence = Angle of reflection)

$\Rightarrow \angle ABE = \angle CBE = \frac{1}{2} \times \angle ABC$ ...(1)

Similarly, $\angle BCF = \angle FCD = \frac{1}{2} \times \angle DCB$ ...(2)

Now, BE || CF

$\Rightarrow \angle CBE = \angle BCF$ (alternate angles)

$\Rightarrow \frac{1}{2} \times \angle ABC = \frac{1}{2} \times \angle DCB$ {by (1) and (2)}

$\Rightarrow \angle ABC = \angle DCB$

$\Rightarrow AB \parallel CD$