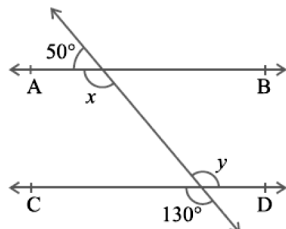


NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles Ex 6.2

Question 1.

In figure find the values of x and y and then show that $AB \parallel CD$.



Solution.

From the figure:

$$x + 50^\circ = 180^\circ \text{ (Linear pair)}$$

$$x = 130^\circ$$

And,

$$y = 130^\circ \text{ (Vertically opposite angles)}$$

Now,

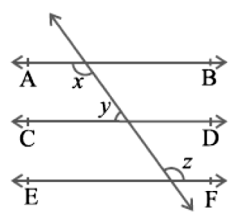
$$x = y = 130^\circ \text{ (Alternate interior angles)}$$

Hence,

$$AB \parallel CD$$

Question 2.

In figure, if $AB \parallel CD$, $CD \parallel EF$ and $y : z = 3 : 7$, find x .



Solution.

It is given in the question that:

$AB \parallel CD$ and $CD \parallel EF$

$$y : z = 3 : 7$$

Now,

$$x + y = 180^\circ \text{ (Angles on the same side of transversal)}$$

And,

$$\angle O = z \text{ (Corresponding angles)}$$

And,

$$y + \angle O = 180^\circ \text{ (Linear pair)}$$

$$y + z = 180^\circ$$

Now, according to question,

$$y = 3w \text{ and,}$$

$$z = 7w$$

$$3w + 7w = 180^\circ$$

$$10w = 180^\circ$$

$$w = 18^\circ$$

Hence,

$$y = 3 * 18^\circ = 54^\circ$$

And,

$$z = 7 * 18^\circ = 126^\circ$$

Now,

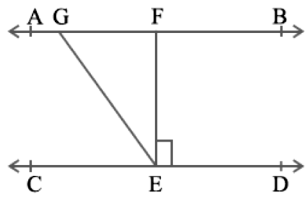
$$x + y = 180^\circ$$

$$x + 54^\circ = 180^\circ$$

$$x = 126^\circ$$

Question 3.

In figure, if $AB \parallel CD$, $EF \perp CD$ and $\angle GED = 126^\circ$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$.



Solution.

It is given in the question that:

$AB \parallel CD$

EF perpendicular CD

$$\angle GED = 126^\circ$$

Now, according to the question,

$$\angle FED = 90^\circ \text{ (EF perpendicular CD)}$$

Now,

$\angle AGE = \angle GED$ (Since, AB parallel CD and GE is transversal, hence alternate interior angles)

Therefore,

$$\angle AGE = 126^\circ$$

And,

$$\angle GEF = \angle GED - \angle FED$$

$$\angle GEF = 126^\circ - 90^\circ$$

$$\angle GEF = 36^\circ$$

Now,

$$\angle FGE + \angle AGE = 180^\circ \text{ (Linear pair)}$$

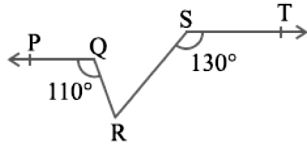
$$\angle FGE = 180^\circ - 126^\circ$$

$$\angle FGE = 54^\circ$$

Question 4.

In figure if $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find $\angle QRS$.

[Hint: Draw a line parallel to ST through point R .]

**Solution.**

It is given in the question that:

PQ parallel ST ,

$\angle PQR = 110^\circ$ and,

$\angle RST = 130^\circ$

Construction: Draw a line XY parallel to PQ and ST

$\angle PQR + \angle QRX = 180^\circ$ (Angles on the same side of transversal)

$110^\circ + \angle QRX = 180^\circ$

$\angle QRX = 70^\circ$

And,

$\angle RST + \angle SRY = 180^\circ$ (Angles on the same side of transversal)

$130^\circ + \angle SRY = 180^\circ$

$\angle SRY = 50^\circ$

Now,

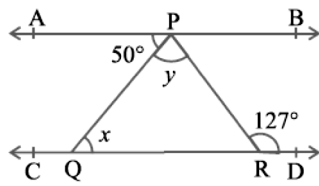
$\angle QRX + \angle SRY + \angle QRS = 180^\circ$

$70^\circ + 50^\circ + \angle QRS = 180^\circ$

$\angle QRS = 60^\circ$

Question 5.

In figure, if $AB \parallel CD$, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$, find x and y .



Solution.

It is given in the question that:

AB parallel CD ,

$\angle APQ = 50^\circ$ and,

$\angle PRD = 127^\circ$

According to question,

$x = 50^\circ$ (Alternate interior angle)

$\angle PRD + \angle RPB = 180^\circ$ (Angles on the same side of transversal)

$127^\circ + \angle RPB = 180^\circ$

$\angle RPB = 53^\circ$

Now,

$y + 50^\circ + \angle RPB = 180^\circ$ (AB is a straight line)

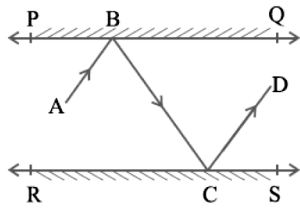
$y + 50^\circ + 53^\circ = 180^\circ$

$y + 103^\circ = 180^\circ$

$y = 77^\circ$

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 $AB \parallel CD$.



Solution.

It is given in the question that:

PQ is parallel RS

And,

BE parallel to CF

According to laws of reflection, we know that:

Angle of incidence = Angle of reflection

$\angle 1 = \angle 2$ and,

$\angle 3 = \angle 4$ (i)

And,

$\angle 2 = \angle 3$ (Alternate interior angles, since BE is parallel to CF and a transversal line BC cut them at B and C respectively) (ii)

From (i) and (ii), we get

$$\angle 1 + \angle 2 = \angle 3 + \angle 4$$

$$\angle ABC = \angle DCB$$

AB parallel CD (Alternate interior angles)