Pair of Linear Equations in Two varibles Ex 3.11 Q9

Answer :

We know that the sum of the opposite angles of cyclic quadrilateral is $180°$ .in the cyclic quadrilateral $ABCD$, angles A and C and angles B and D pairs of opposite angles

Therefore $\angle A+\angle C=180°$ and $\angle B+\angle D=180°$

Taking $\angle A+\angle C=180°$

By substituting $\angle A=(2x+4)°$ and $\angle c=(2y+10)°$ we get

$$2x+4+2y+10=180$$

$$2x+2y+14=180°$$

$$2x+2y=180°-14°$$

$$2x+2y=166\cdots(i)$$

Taking $\angle B+\angle D=180°$

By substituting $\angle B=(y+3)°$ and $\angle D=(4x-5)°$ we get

$$y+3+4x-5=180°$$

$$4x+y-5+3=180°$$

$$4x+y-2=180°$$

$$4x+y=180°+2°$$

$$4x+y=182°\cdots(ii)$$

By multiplying equation (ii) by 2 we get $8x+2y=364\cdots(iii)$

By subtracting equation (iii) from (i) we get

$$\begin{array}{r} 2x+2y=166 \\ -8x-2y=-364 \\ \hline -6x=-198 \end{array}$$

$$x=\frac{-198}{-6}$$

$$x=33^\circ$$

By substituting $x=33^\circ$ in equation (ii) we get

$$4x+y=182$$

$$4\times 33+y=182$$

$$132+y=182$$

$$y=182-132$$

$$y=50$$

The angles of a cyclic quadrilateral are

$$\angle A=2x+4$$

$$=2\times 33+4$$

$$=66+4$$

$$=70^\circ$$

$$\angle B=y+3$$

$$=50+3$$

$$=53^\circ$$

$$\angle C=2y+10^\circ$$

$$=2\times 50+10$$

$$=100+10$$

$$=110^\circ$$

$$\angle D=4x-5$$

$$=4\times 33-5$$

$$=132-5$$

$$=127^\circ$$

Hence, the angles of cyclic quadrilateral ABCD are $\boxed{\angle A=70^\circ,\angle B=53^\circ,\angle C=110^\circ,\angle D=127^\circ}$.

Pair of Linear Equations in Two varibles Ex 3.11 Q10

Answer :

Let take first class full of fare is Rs x and reservation charge is Rs y per ticket

Then half of the ticket as on full ticket $=\frac{x}{2}$

According to the given condition we have

$$x+y=216\cdots(i)$$

$$x+y+\left(\frac{x}{2}\right)+y=327$$

$$x+\frac{x}{2}+y+y=327$$

$$\frac{3x}{2}+2y=327\cdots(ii)$$

Multiplying equation (i) by 2 we have

$$2x+2y=432\cdots(iii)$$

Subtracting (ii) from (iii) we get

$$\begin{array}{r} 2x+2y=432 \\ -\frac{3x}{2}-2y=-327 \\ \hline 2x-\frac{3x}{2}=105 \end{array}$$

$$\frac{4x-3x}{2}=105$$

$$\frac{1x}{2}=105$$

$$x=105\times 2$$

$$x=210$$

Putting $x=210$ in equation (i) we get

$$x+y=216$$

$$210+y=216$$

$$y=216-210$$

$$y=6$$

Hence, the basic first class full fare is $\boxed{\text{Rs } 210}$

The reservation charge is $\boxed{\text{Rs } 6}$.

********** END **********