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

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

$\quad 2x + 2y + 14 = 180°$

$\qquad 2x + 2y = 180° - 14°$

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

Taking $\angle B + \angle D = 180°$

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

$y + 3 + 4x - 5 = 180°$

$4x + y - 5 + 3 = 180°$

$\quad 4x + y - 2 = 180°$

$\qquad 4x + y = 180° + 2°$

$4x + y = 182° \cdots (ii)$

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

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

$$2x + 2y = 166$$
$$-8x - 2y = -364$$
$$\overline{-6x = -198}$$

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

$$x = 33°$$

By substituting $x = 33°$ 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

$$\angle A = 2x + 4$$
$$= 2 \times 33 + 4$$
$$= 66 + 4$$
$$= 70°$$
$$\angle B = y + 3$$
$$= 50 + 3$$
$$= 53°$$
$$\angle C = 2y + 10°$$
$$= 2 \times 50 + 10$$
$$= 100 + 10$$
$$= 110°$$
$$\angle D = 4x - 5$$
$$= 4 \times 33 - 5$$
$$= 132 - 5$$
$$= 127°$$

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

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 $= \dfrac{x}{2}$

According to the given condition we have

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

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

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

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

Multiplying equation (i) by 2 we have

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

Subtracting (ii) from (iii) we get

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

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

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

$x = 105 \times 2$

$x = 210$

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 *********