

## STRAIGHT LINE EQUATION PASSING THROUGH GIVEN TWO POINTS

### Different Methods

#### Question:

Find the equation of the straight line passing through the points (-1, 1) and (2, -4)

#### Method 1: (By Two Points Formula)

$$\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}$$

$A(x_1, y_1), B(x_2, y_2)$  Here  $x_1 = -1, y_1 = 1$  and  $x_2 = 2, y_2 = -4$

$$\frac{y - 1}{-4 - 1} = \frac{x + 1}{2 + 1}$$

$$5x + 3y + 2 = 0$$

#### Method 2: (By slope ( $m$ ) and y intercept formula)

$$y = mx + c$$

It passes (-1, 1)

$$1 = -m + c \dots\dots\dots (1)$$

Again it passes (2,-4)

$$-4 = 2m + c \dots\dots\dots (2)$$

On solving (1) and (2), we get

$$m = -\frac{5}{3} \text{ and } c = -\frac{2}{3}$$

The Required Equation is  $5x + 3y + 2 = 0$

#### Method 3: (Vedic Method)

$$(y_1 - y_2)x - (x_1 - x_2)y = (x_2y_1 - x_1y_2)$$

We have

$$x_1 = -1, y_1 = 1$$

$$x_2 = 2, y_2 = -4$$

$$5x - (-3y) = 2 - 4$$

$$5x + 3y + 2 = 0$$

*[Difference of y co – ordinates]x – [difference of x co – ordinates]y  
= product of the means minus the products of the extremes*

One can see from the mentioned above example, easy to get the equation by using Vedic idea, Problem can be solved mentally just by looking.

**Method 4: (Cross Product (or) Determinant Method)**

$$\begin{vmatrix} x - x_1 & y - y_1 \\ x - x_2 & y - y_2 \end{vmatrix}$$

$$\begin{vmatrix} x + 1 & y - 1 \\ x - 2 & y + 4 \end{vmatrix}$$

$$(x + 1)(y + 4) - (x - 2)(y - 1) = 0$$

$$5x + 3y + 2 = 0$$

**Method 5: (Determinant Method)**

$$\begin{vmatrix} x & y_1 \\ x & y_2 \end{vmatrix} - \begin{vmatrix} y & x_1 \\ y & x_2 \end{vmatrix} = \begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \end{vmatrix}$$

$$\begin{vmatrix} x & 1 \\ x & -4 \end{vmatrix} - \begin{vmatrix} y & -1 \\ y & 2 \end{vmatrix} = \begin{vmatrix} -1 & 1 \\ 2 & -4 \end{vmatrix}$$

$$(-4x - x) - (2y + y) = 4 - 2$$

$$-5x - 3y = 2$$

$$5x + 3y = -2$$

$$5x + 3y + 2 = 0$$

Note: The equation of the straight line passing through the points (0,) and  $(x_1, y_1)$  is  $y = \frac{y_1}{x_1}x$

Example: The equation of the straight line passing through

the points (0, 0) and (3, 4)  $y = \frac{4}{3}x$

My Interest of teaching mathematics ,influenced to discover a new formula(method-5 ) to find the equation of the straight line passing through the two points  $(x_1, y_1)$  and  $(x_2, y_2)$ . By using this method one we can find the equation of the straight line easily. The students of class X should take this method as a cross - multiplication method.

**Author: K. Thirumurugan, he has been actively engaged in the school maths, discovering innovative idea, teaching of math joyfully, served as a resource person. He may be contacted at [thirumathstimes@gmail.com](mailto:thirumathstimes@gmail.com)**