

1-3-Slope of a Line Formula

The slope of a line can be calculated from the equation of the line. The general slope of a line formula is given as,

$$y = mx + b$$

$$y - y_1 = m(x - x_1)$$

Example:

What is the equation of a line whose slope is 1, and that passes through the point (-1, -5)?

Solution:

We know that if the slope is given as 1, then the value of m will be 1 in the general equation

$$y - y_1 = m(x - x_1)$$

$$Y - (-5) = 1(x - (-1))$$

$$y + 5 = x + 1$$

$$y = x + 1 - 5$$

$$y = x - 4$$

$$b = -4$$

1-4- Slope Intercept Form Definition

The slope-intercept form of a straight line is used to find the equation of a line. For the slope-intercept formula, we have to know the slope of the line and the intercept cut by the line with the y-axis. Let us consider a straight line of slope 'm' and y-intercept 'b'. The slope intercept form equation for a straight line with a slope, 'm', and 'b' as the y-intercept can be given as: $(y = mx + b)$.

Slope Intercept Formula in Math

Using the slope-intercept formula, the equation of the line is:

$$y = mx + b$$

$$Ax + By = C$$

$$m = -A / B$$

$$b = C / B$$

Example :

The equation of a line is $3x + 4y + 5 = 0$. Determine the slope and y-intercept of the line using the slope intercept form.

Solution:

We re-arrange the equation of the line to write it in the standard form

$$y = mx + b.$$

We have:

$$4y = -3x - 5$$

$$\Rightarrow y = (-3/4)x + (-5/4)$$

Thus, $m = -3/4$, $b = -5/4$

Answer: The slope of the given straight line,

$$m = -3/4$$

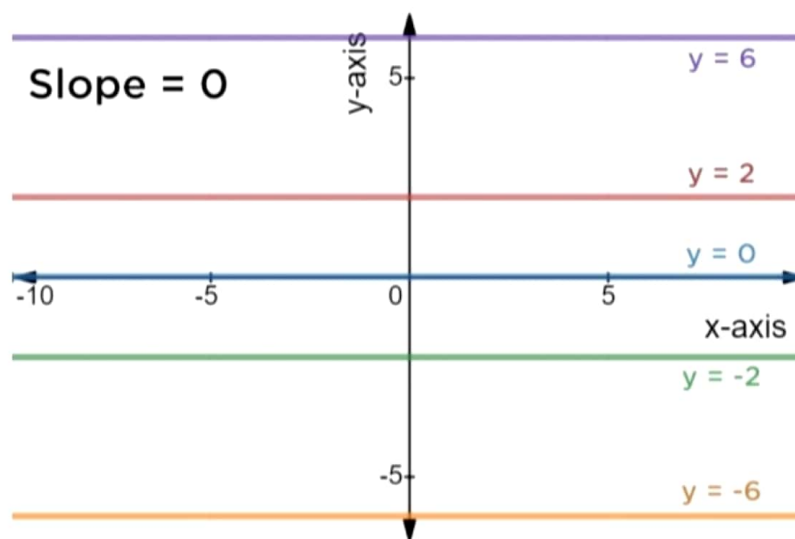
and the y-intercept , $b = -5/4$.

1-5 -Slope of Horizontal Line

We know that , a horizontal line is a straight line that is parallel to the x-axis or is drawn from left to right or right to left in a coordinate plane. Therefore, the net change in the y-coordinates of the horizontal line is zero. The slope of a horizontal line can be given as,

Slope of a horizontal line,

$$m = \Delta y / \Delta x = \text{zero} \quad \text{and} \quad Y = b$$



Example:

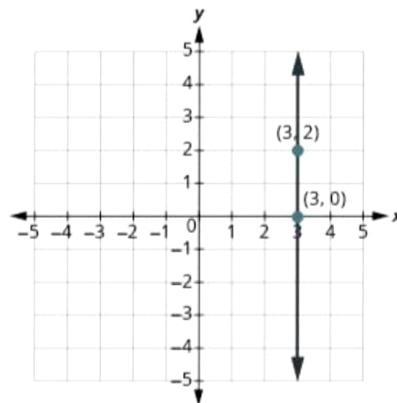
Find an equation for the horizontal line passes through the point (2,-3)

Answer: $y=b$, $Y = -3$

1-6 -Slope of Vertical Line

We know that, a vertical line is a straight line that is parallel to the y-axis or is drawn from top to bottom or bottom to top in a coordinate plane. Therefore, the net change in the x-coordinates of the vertical line is zero. The slope of a vertical line can be given as,

$$X = a$$



Example:

Find an equation for the vertical line passes through the point (5,0)

Answer: $x=a$, $X=5$

Example:

Find the slope of each line:

1. $x=8$
2. $y=-5$

Answer:

$$x=8$$

This is a vertical line, so its slope is undefined.