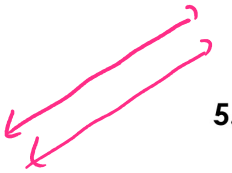
5.4 Part 2

Tuesday, May 2, 2023 3:35 PM



5.4 Slope-Point Form of the Equation for a Linear Function – Part 2

Example 1 : Write the equation of a line that passes through the point $R\,(1,-1)$ and is parallel to the line $y=\frac{2}{3}x-5$.

parallel lines have same slope

$y=\frac{2}{3}x-5$

$y=mx+b$

$m=$ slope

Slope $=\frac{2}{3}$

||

new line

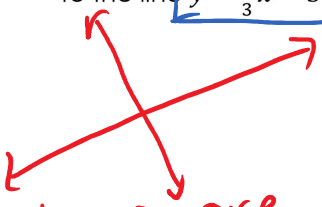
slope $=\frac{2}{3}$ point $(1,-1)$ x_1 y_1

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

$y-(-1)=\frac{2}{3}(x-1)$

$y+1=\frac{2}{3}(x-1)$

Example 2 : Write the equation of a line that passes through the point $R\,(1,-1)$ and is perpendicular to the line $y=\frac{2}{3}x-5$.



Slopes are negative reciprocals

$y=\frac{2}{3}x-5$

$y=mx+b$

$m=\frac{2}{3}$

1 $m=\frac{-3}{2}$

slope $=-\frac{3}{2}$ point $(1,-1)$ x_1 y_1

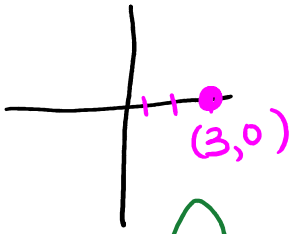
$y-y_1=m(x-x_1)$

$y-(-1)=-\frac{3}{2}(x-1)$

$y+1=-\frac{3}{2}(x-1)$

Example 3 : Write the equation of a line with a x-intercept of 3 that is perpendicular to the line $y = 3x + 5$.

x-intercept of 3



$y = 3x + 5$

$y = mx + b$ slope intercept

$m = 3$ $\perp$ $m = -\frac{1}{3}$

point $(3, 0)$ (x_1, y_1) $m = -\frac{1}{3}$

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

$y - 0 = -\frac{1}{3}(x - 3)$

$y = -\frac{1}{3}(x - 3)$

Example 4 : Write the equation for a line that passes through the given points. Write the equation in both point slope form and slope intercept form. Graph the line.

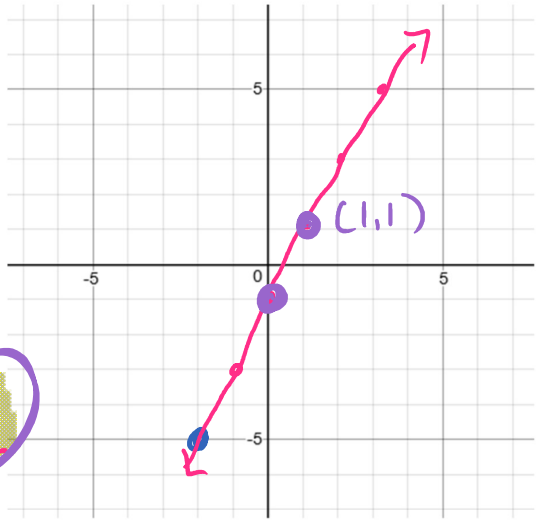
$A(-2, -5)$ and $B(1, 1)$ (x_1, y_1) (x_2, y_2)

point slope form first

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

$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{1 - (-5)}{1 - (-2)} = \frac{6}{3} = 2$



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

$y + 5 = 2(x + 2)$

$y = mx + b$

$b = y\text{-intercept}$

$b = -1$

$y = 2x - 1$