Warm Up

December 1

A line which passes through the points (1,-5) and (-2,6).

(1,-5)

a) What is the equation of the line (in general form)?

~~$y=mx+b$~~ no y-int

$y-y_1=m(x-x_1)$ ✓

pt, slope

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

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

$=-\frac{11}{3}$

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

$(3)y+5=-\frac{11}{3}(x-1)$ (3)

$3(y+5)=-11(x-1)$

$3y+15=-11x+11$

$11x+3y+15-11=0$

$11x+3y+4=0$

b) What is the y-intercept?

$y=mx+b$

$11x+3y+4=0$

$\frac{3y}{3}=\frac{-11x}{3}-\frac{4}{3}$

$y=-\frac{11}{3}x-\frac{4}{3}$

$y\text{-int}=-\frac{4}{3}$

$(0,-\frac{4}{3})$

method 2

$11x+3y+4=0$

y-int let $x=0$

$11(0)+3y=-4$

$\frac{3y}{3}=\frac{-4}{3}$

$y=-\frac{4}{3}$

$(0,-\frac{4}{3})$

Example 4 Writing an Equation of a Line That Is Parallel or Perpendicular to a Given Line

Write an equation for the line that passes through R(1, −1) and is:

a) parallel to the line $y = \frac{2}{3}x - 5$

b) perpendicular to the line $y = \frac{2}{3}x - 5$

a) $m = \frac{2}{3}$ R(1,-1)

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

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

b) $\perp m = -\frac{3}{2}$ R(1,-1)

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

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

CHECK YOUR UNDERSTANDING

Practice problems...

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#5. $m = -5$ $(-4, 2)$

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

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

9. i) $m = \frac{\text{rise}}{\text{run}}$ $(-2, 4)$

$= \frac{-4}{3}$

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

$y - 4 = \frac{-4}{3}(x + 2)$

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

$3y - 12 = -4x - 8$

$3y = -4x - 8 + 12$

$\frac{3y}{3} = \frac{-4x}{3} + \frac{4}{3}$

$y = \frac{-4}{3}x + \frac{4}{3}$

y-int $= \frac{4}{3}$ $(0, \frac{4}{3})$

x-int $= (1, 0)$

(graph)