3.4 Notes
Day 3

WRITING EQUATIONS OF LINES

UNLESS YOU'RE GIVEN THE SLOPE AND Y-INTERCEPT, USE POINT-SLOPE FORM FIRST!

- Given **slope** and **a point**: use point slope form, then convert
- Given **two points**: find SLOPE! then use point-slope form.

USE THE GIVEN INFO TO WRITE A LINEAR EQUATION IN THE INDICATED FORM:

1) Passes through the point (5, -3) with slope $\frac{1}{2}$. **(slope-intercept form)**

$y+3=\frac{1}{2}(x-5)$

$y+3=\frac{1}{2}x-\frac{5}{2}$

$y=\frac{1}{2}x-\frac{5}{2}-\frac{6}{2}$

$\boxed{y=\frac{1}{2}x-\frac{11}{2}}$

YOU TRY:

2) Passes through the point (-5, 6) with slope $-\frac{2}{3}$. **(slope-intercept form)**

$y-6=-\frac{2}{3}(x+5)$

$y-6=-\frac{2}{3}x-\frac{10}{3}$

$y=-\frac{2}{3}x-\frac{10}{3}+\frac{18}{3}$

$\boxed{y=-\frac{2}{3}x+\frac{8}{3}}$

3) Passes through the point (8, -3) with slope $\frac{1}{6}$. **(standard form)**

$y+3=\frac{1}{6}(x-8)$

$y+3=\frac{1}{6}x-\frac{4}{3}$

$y=\frac{1}{6}x-\frac{4}{3}-\frac{9}{3}$

$y=\frac{1}{6}x-\frac{13}{3}$

$\left(-\frac{1}{6}x+y=-\frac{13}{3}\right)6$

$\boxed{-x+6y=-26}$

YOU TRY:

4) Passes through the point (5, -1) with slope $-\frac{1}{3}$. **(standard form)**

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

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

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

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

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

$\boxed{x+3y=2}$

GIVEN TWO POINTS

5) Has an x intercept of -3 and a y intercept of 4. **(slope-intercept form)**

$(-3, 0)$ $(0, 4)$ ← this is the y-intercept

Find slope: $\frac{4-0}{0--3} = \frac{4}{3}$

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

YOU TRY:

6) Passes through the point (2, -1) and has a y-intercept of 3. **(slope-intercept form)**

$(2, -1)$ $(0, 3)$ ← y int

Find slope: $\frac{3--1}{0-2} = \frac{4}{-2} = -2$

$$y = -2x + 3$$

7) Passes through the points (2, 4) and (-5, 6). **(standard form)**

$(2, 4)$ $(-5, 6)$

Find slope: $\frac{6-4}{-5-2} = \frac{2}{-7}$

Pt. Slope: $y - 4 = -\frac{2}{7}(x - 2)$

$y - 4 = -\frac{2}{7}x + \frac{4}{7}$

$y = -\frac{2}{7}x + \frac{4}{7} + \frac{28}{7}$

$y = -\frac{2}{7}x + \frac{32}{7}$

$\frac{2}{7}x + y = \frac{32}{7}$

$$2x + 7y = 32$$

YOU TRY:

8) Passes through the points (3, 11) and (-6, 5). **(standard form)**

Find slope: $\frac{11-5}{3--6} = \frac{6}{9} = \frac{2}{3}$

$y - 11 = \frac{2}{3}(x - 3)$

$y - 11 = \frac{2}{3}x - 2$

$y = \frac{2}{3}x + 9$

$-\frac{2}{3}x + y = 9$

$$-2x + 3y = 27$$