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Class: Honors Geometry

Date: 9/14/06

Topic: Lesson 3-5 (Lines in the Coordinate Plane)

Slope-intercept form $y = mx + b$
where $m =$ slope, $b =$ y-intercept (where cross y-axis)
Find equation of line given slope and y-intercept

Slope “rise over run”
Change in $y \div$ change in x
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example Pg. 155, #4
$$y = -\frac{5}{3}x + 2,$$

$$m = -\frac{5}{3},$$

 $b = 2$ or $(0, 2)$

Standard form of a linear equation $Ax + By = C$
Where A, B, C are real #'s and $A \& B$ are not 0.
To graph find x and y intercepts (subst 0 in for x then y)

Example Pg. 155, #10
 $1.2x + 2.4y = 2.4$
 y intercept: $1.2(0) + 2.4y = 2.4$ or $y = 1 \dots (0, 1)$
 x intercept: $1.2x + 2.4(0) = 2.4$ or $x = 2 \dots (2, 0)$

Example Pg. 155, #16
$$\frac{3}{4}x - \frac{1}{2}y = \frac{1}{8}$$

$$6x - 4y = 1$$

$$-4y = -6x + 1$$

$$y = \frac{3}{2}x - \frac{1}{4}$$

$$m = \frac{3}{2}, b = -\frac{1}{4}$$
 or $(0, -\frac{1}{4})$

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Point-slope form

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

Find line given 1 pt and the slope

Example

Pg. 155, #20

$A(-2, -6)$, slope -4

$$y - (-6) = (-4)(x - (-2))$$

$$y + 6 = -4(x + 2)$$

Example

Pg. 155, #28

$P(8, 10)$, $Q(-4, 2)$

$$y - 10 = \left(\frac{10 - 2}{8 - (-4)}\right)(x - 8)$$

$$y - 10 = \frac{8}{12}(x - 8)$$

$$y - 10 = \frac{2}{3}(x - 8)$$

Horizontal line

$m = 0$ (change in y is 0)

horiz line through (a, b) is: $y = b$

Vertical line slope

$m = \text{undefined}$ (change in x is 0 – can't divide by 0)

vert line through (a, b) is: $x = a$

Pg. 155, #32

$E(6, 4)$

a) $y = 4$

b) $x = 6$