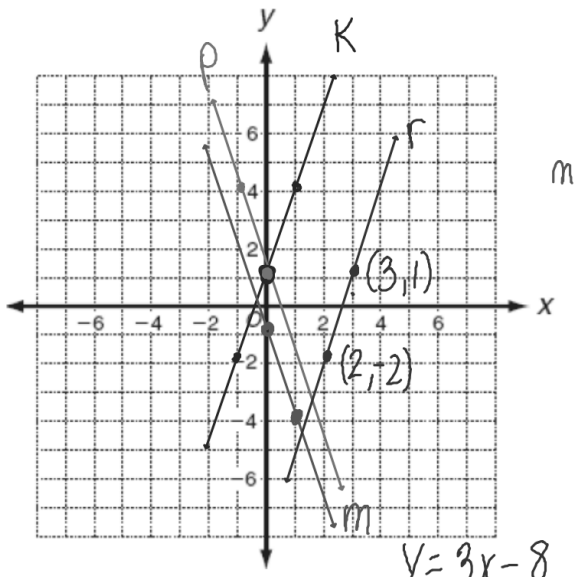
Geometry Notes Chapter 9 Supplement--Algebra

Applying Transformations to Lines

May 22

Recall that the equation of a line in slope-intercept form is ***y = mx + b***, where *m* is the slope of the line, *b* is the *y*-intercept of the line, and (*x*, *y*) represents any point on the line.



Graph line *k*: $y = \frac{3}{1}x + 1$. (m = 3, b = 1)

a. Reflect line *k* across the *x*-axis. Label the reflected line *m*. Write the equation of line *m* in slope-intercept form.

$m = \frac{-3}{1}$ $\quad y = -3x - 1$

b. Reflect line *k* across the *y*-axis. Label the reflected line *p*. Write the equation of line *p* in slope-intercept form.

$y = -3x + 1$

rt. down

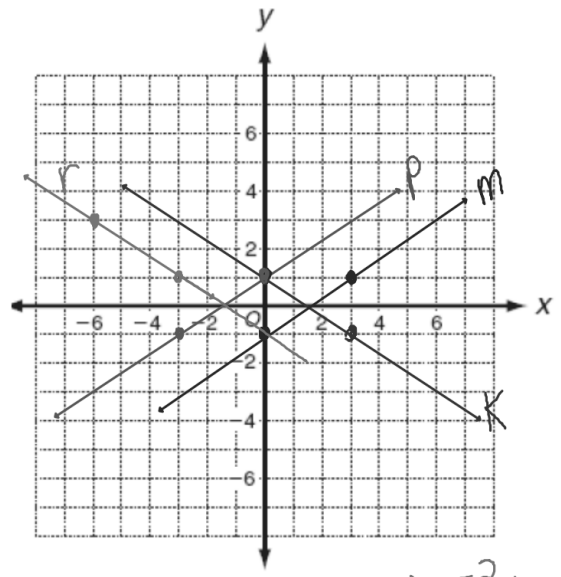
c. Translate line *k* along the vector ⟨2, -3⟩. Label the reflected line *r*. Write the equation of line *r* in slope-intercept form.

(0,1) (1,4)
+2 -3 +2 -3

$y = mx + b$ $\quad 1 = 3 \cdot 3 + b$ $\quad -8 = b$

$m = 3$ (3,1)

$y = 3x - 8$



Graph line *k*: $2x + 3y = 3$

$-2x \quad -2x$

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

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

a. Reflect line *k* across the *x*-axis. Label the reflected line *m*. Write the equation of line *m* in slope-intercept form.

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

b. Reflect line *k* across the *y*-axis. Label the reflected line *p*. Write the equation of line *p* in slope-intercept form.

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

left up

c. Translate line *k* along the vector ⟨-6, 2⟩. Label the reflected line *r*. Write the equation of line *r* in slope-intercept form.

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

(0,1) (3,-1)
-6 +2 -6 +2
(-6,3) (-3,1)

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

$y = mx + b$ $\quad b = -1$

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

$1 = 2 + b$