✚ *homework check:* __NPM 9__ **p. 153 # 1 – 3, p. 156 # 3, 7, 8, 11, 17**

✚ *note:* __Equivalent Linear Relations__

   Linear relations can have several different forms, the main difference being slope intercept and standard form. We are most familiar with slope intercept form $y = mx + b$, but linear relations can also be written in standard form $Ax + By + C = 0$. In standard form, the value of A must be positive and there can be no fractions.
   Standard form lends itself nicely to determining both x and y intercepts. For example, an x intercept occurs when the value of y is zero. Likewise, a y intercept occurs when the value of x is zero. We use this information to find intercepts.

a) $3x + 2y - 6 = 0$

To find an x intercept, set $y = 0$

$3x + 2(0) - 6 = 0$

$3x - 6 = 0$

$3x = 6$

$x = 2$

therefore $(2,0)$ is the x intercept

b) $2x - 3y + 12 = 0$

To find a y intercept, set $x = 0$

$2(0) - 3y + 12 = 0$

$-3y + 12 = 0$

$-3y = -12$

$y = 4$

therefore $(0,4)$ is the y intercept

   Any equation in standard form can be used to find both intercepts. Be careful to include the points in correct intercept form.
   These intercepts can be used to graph any relation by joining the two points you find. For example, graph $3x - 4y + 12 = 0$.

$3x - 4y + 12 = 0$

for x intercepts, set $y = 0$

$3x - 4(0) + 12 = 0$

$3x + 12 = 0$

$3x = -12$

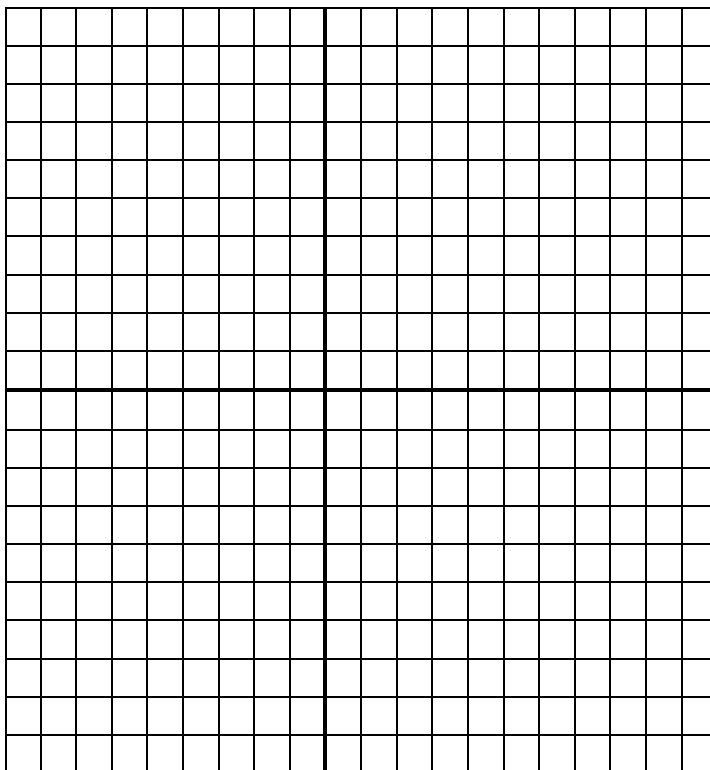$x = -4$

x intercept $(-4,0)$

for y intercepts, set $x = 0$

$3(0) - 4y + 12 = 0$

$-4y + 12 = 0$

$-4y = -12$

$y = 3$

y intercept $(0,3)$

Rearrange each of the following into standard form.

$a)y = \dfrac{1}{3}x + 2$

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

$3(y - 2) = x$

$3y - 6 = x$ *must move everything to right to keep x positive

$0 = x - 3y + 6$

$b)y = -2x + 3$

$y - 3 = -2x$ *move everything to left to make the x positive

$2x + y - 3 = 0$

Rearrange into slope intercept form.

$c)2x - 5y + 2 = 0$

$2x + 2 = 5y$

$\dfrac{2x}{5} + \dfrac{2}{5} = y$

⊞ *homework assignment:* <u>**NPM 9**</u> **p. 169 # 3 – 6, 8, 9, 13, 15, 16**