Math 10C   **Linear Functions Assignment**

1) Find the equation of a line for the following in all **three** forms.

   a. A line that has slope $-\frac{3}{2}$ and passes through the y-axis at -1.

Slope Point Form	Slope Y-intercept Form	General Form
Using point $(0,-1)$ $(y-y_1) = m(x-x_1)$ $(y+1) = -\frac{3}{2}(x-0)$ ⟸	$y = -\frac{3}{2}x - 1$ ⟹	$y = -\frac{3}{2}x - 1$ $\frac{3}{2}x + 1y + 1 = 0$ $3x + 2y + 2 = 0$

   b. A Line has slope $\frac{5}{4}$ and passes thru (-1,4)

Slope Point Form	Slope Y-intercept Form	General Form
$(y-y_1) = m(x-x_1)$ $(y-4) = \frac{5}{4}(x+1)$ ⟹	$y-4 = \frac{5}{4}(x+1)$ $y-4 = \frac{5}{4}x + \frac{5}{4}$ $y = \frac{5}{4}x + \frac{21}{4}$ ⟹	$y = \frac{5}{4}x + \frac{21}{4}$ $0 = \frac{5}{4}x - 1y + \frac{21}{4}$ $0 = 5x - 4y + 21$

   c. Line passes thru (-2,5) and (3,-4)

Slope Point Form	Slope Y-intercept Form	General Form
$m = \frac{y_2-y_1}{x_2-x_1} = \frac{-4-5}{3-(-2)} = \frac{-9}{5}$ $(y-y_1) = m(x-x_1)$ $(y+4) = -\frac{9}{5}(x-3)$ ⟹	$y+4 = -\frac{9}{5}(x-3)$ $y+4 = -\frac{9}{5}x + \frac{27}{5}$ $y = -\frac{9}{5}x + \frac{7}{5}$	$y = -\frac{9}{5}x + \frac{7}{5}$ $\frac{9}{5}x + 1y - \frac{7}{5} = 0$ $9x + 5y - 7 = 0$

   d. Line has an x-intercept of 5 and a y-intercept of $\frac{2}{3}$.   Points $(5,0)$ and $(0,\frac{2}{3})$

   $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad x_1\ y_1 \quad\quad\quad x_2\ y_2$

Slope Point Form	Slope Y-intercept Form	General Form
$m = \frac{y_2-y_1}{x_2-x_1} = \frac{\frac{2}{3}-0}{0-5} = -\frac{2}{15}$ $(y-y_1) = m(x-x_1)$ $(y-0) = -\frac{2}{15}(x-5)$ ⟹	$y-0 = -\frac{2}{15}(x-5)$ $y = -\frac{2}{15}x + \frac{2}{3}$	$y = -\frac{2}{15}x + \frac{2}{3}$ $\frac{2}{15}x + 1y - \frac{2}{3} = 0$ $2x + 15y - 10 = 0$

2) Complete the following chart.

Slope Point Form	Slope Y-intercept Form	General Form
$y = 1x - 1$ Point $(0, -1)$ $(y - y_1) = m(x - x_1)$ $(y + 1) = 1(x - 0)$	$y = x - 1$	$y = x - 1$ $0 = x - y - 1$
$y + 3 = -2(x - 2)$	$(y + 3) = -2(x - 2)$ $y + 3 = -2x + 4$ $y = -2x + 1$	$2x + 1y - 1 = 0$
$y = -\frac{2}{3}x + 2$ Point $(0, 2)$ $(y - y_1) = m(x - x_1)$ $(y - 2) = -\frac{2}{3}(x - 0)$	$2x + 3y - 6 = 0$ $3y = -2x + 6$ $y = -\frac{2}{3}x + 2$	$2x + 3y - 6 = 0$
$y = \frac{3}{2}x + 5$ Point $(0, 5)$ $(y - y_1) = m(x - x_1)$ $(y - 5) = \frac{3}{2}(x - 0)$	$y = \frac{3}{2}x + 5$	$y = \frac{3}{2}x + 5$ $\frac{3}{2}x - 1y + 5 = 0$ $3x - 2y + 10 = 0$
$y - 2 = \frac{-1}{2}(x + 2)$	$y - 2 = -\frac{1}{2}(x + 2)$ $y - 2 = -\frac{1}{2}x - 1$ $y = -\frac{1}{2}x + 1$	$y = -\frac{1}{2}x + 1$ $\frac{1}{2}x + 1y - 1 = 0$ $x + 2y - 2 = 0$
$y = \frac{1}{2}x + \frac{3}{2}$ Point $(0, \frac{3}{2})$ $(y - y_1) = m(x - x_1)$ $(y - \frac{3}{2}) = \frac{1}{2}(x - 0)$	$5x - 10y + 15 = 0$ $5x + 15 = 10y$ $\frac{1}{2}x + \frac{3}{2} = y$ $y = \frac{1}{2}x + \frac{3}{2}$	$5x - 10y + 15 = 0$