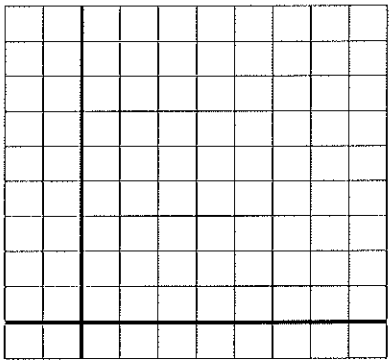
MAT 161 – CLASS NOTES - Sections 2.3 & 2.4: Linear Functions and Slope

1) **x-intercept** – where the line crosses the x-axis

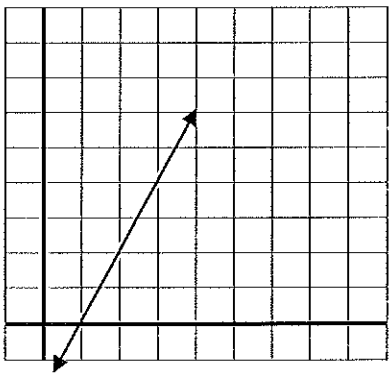
2) **y-intercept** – where the line crosses the y-axis

3) Graph $4x+3y=24$ by finding the x-intercept, y-intercept, and a third point.



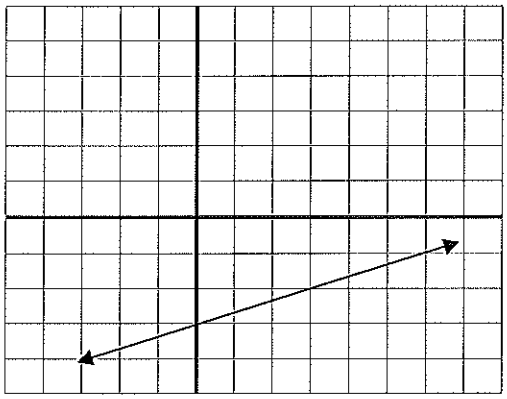
4) **Slope**, denoted by m, is rise over run, so for two points (x_1, y_1) and (x_2, y_2),

5) Estimate the slope of the line below.



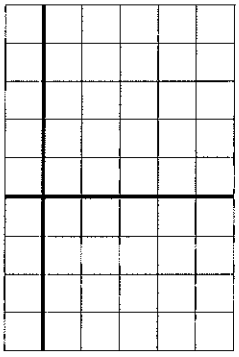
6) **slope-intercept form**

7) Write the slope-intercept form of the equation of the line given below.

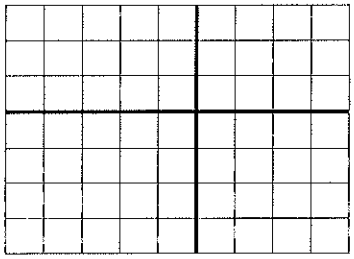


8) Find the slope of the line that goes through each set of points given below, and graph each line.

a) $(4,-2)$ and $(4,3)$

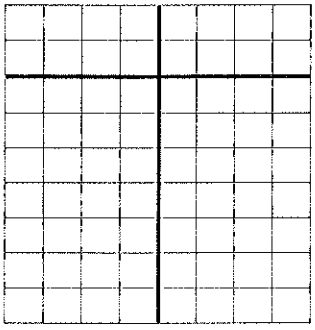


b) $(2,-3)$ and $(-3,-3)$

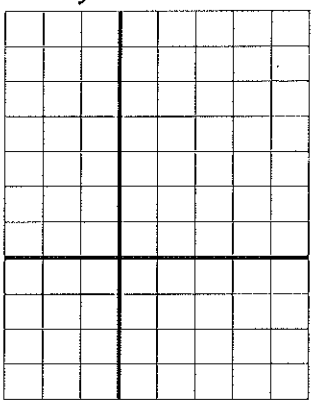


9) Graph each of the following from the given equation.

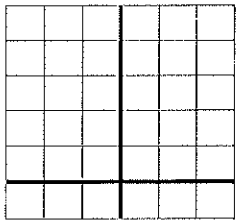
a) $y=\frac{4}{3}x-2$



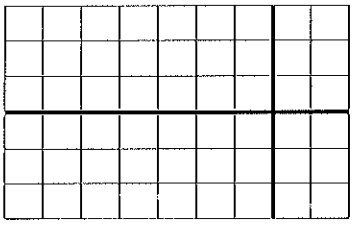
b) $6x+4y=15$



c) $y=2$



d) $x=-5$



10) Find the equation of the line with the indicated slope and y-intercept. Write in slope-intercept form.

a) $m=\frac{4}{5}; y-intercept=-2$

b) $m=-3; y-intercept=1$

11) **slope-point form**

If the slope, m, of a line and a point (x_1, y_1) is known, then the equation for any point (x, y) on the line is:

12) Find the equation of the line passing through the point $(-1,4)$ with slope $m = \frac{2}{3}$. Write in $y = mx + b$ form.

13) Find the equation of the line passing through the two given points. Write in $y = mx + b$ form.

a) $(3,-1)(-2,6)$

b) $(4,-2)(-2,-2)$

14) If two lines are **parallel** ($\parallel$), then they have the **same slope**.

15) If two lines are **perpendicular** ($\perp$), then their **slopes are negative reciprocals (flips)** of each other.

16) Find the equation of a line that goes through the given point and meets the given condition. Write in slope-intercept form.

a) If a line has a slope of $-\frac{2}{3}$, then a line parallel will have a slope of:

b) If a line has a slope of 6, then a line perpendicular will have a slope of:

c) $(-3,2)$; parallel to $y=4x-5$

d) $(-2,0)$; parallel to $-3x+4y=10$

17) Find the equation of a line that goes through the given point and meets the given condition. Write in point-slope form and general form ($Ax + By + C = 0$).

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

18) Find the average rate of change of the function from x_1 to x_2.

$f(x) = x^2 - 2x$ from $x_1 = 3$ to $x_2 = 6$