Ch 2 solutions

8) a) $\{(14,15),(5,7),(3,10),(11,1),(5,8)\}$

not a function; D: $\{3,5,11,14\}$ R $\{1,7,8,10,15\}$

because x value "repeats", in another words the points (5,7) and (5,8) are vertical, thus do not pass the vertical line test.

b) $\{(1,2),(3,2),(6,2),(10,2),(25,2)\}$

this is a function because no x value repeats. All y values are the same, however, that does not determine if a relation is a function or no.

9) a) $f(x) = 5x + 1$

$f(-4) = 5(-4) + 1$

$= -20 + 1$

$= \boxed{-19}$

b) $f(x) = -5x + 1$

$f(3) = -5 \cdot 3 + 1$

$= -15 + 1$

$= \boxed{-14}$

10) $(\overset{x_1}{-3}, \overset{y_1}{7})$ and $(\overset{x_2}{4}, \overset{y_2}{15})$ slope = ?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{15-7}{4-(-3)} = \boxed{\frac{8}{7}}$$

11) slope-intercept form

$$y = mx + b$$

$3x - y = 1$ not in y-int form, so

$-3x \quad -3x$ we need to solve for y

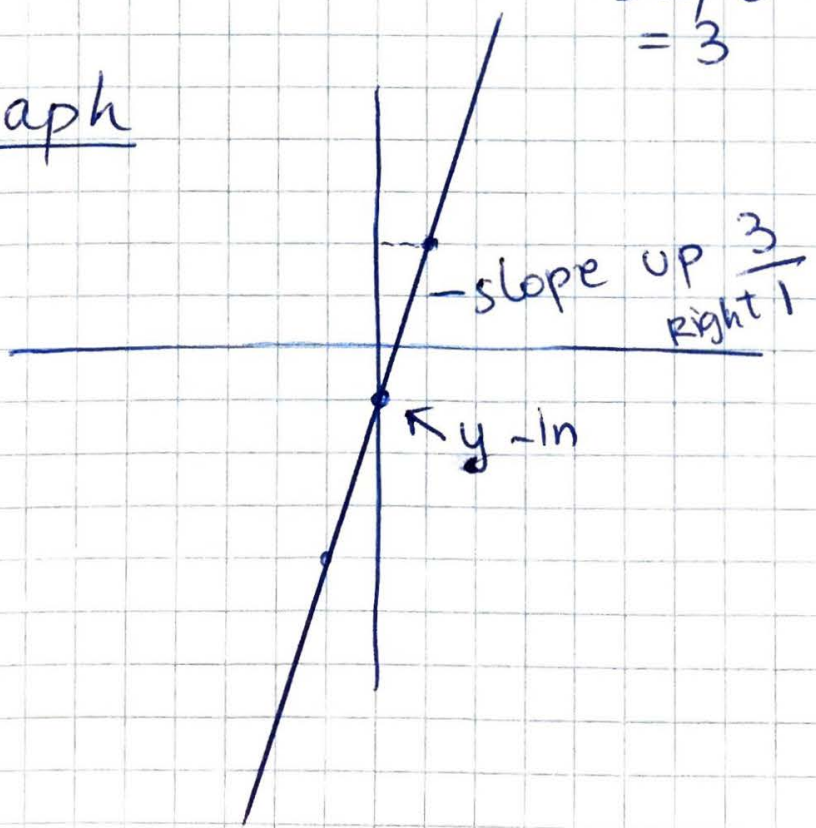
$$\frac{-y}{-1} = \frac{-3x}{-1} + \frac{1}{-1}$$

$$\boxed{y = 3x - 1}$$

slope = 3

y-int = −1

Graph



12) Point-slope form pts $(-10, 18)$ $(6, -14)$

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

values x and y of either of the two given points

slope = ?

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-14 - 18}{6 - (-10)}$$

$$= \frac{-32}{16}$$

$$= -2$$

first possible answer using $(-10, 18)$ for (x_1, y_1)

$$\boxed{y - 18 = -2(x + 10)}$$

negative of a negative is positive

second possible answer using $(6, -14)$

$$\boxed{y + 14 = -2(x - 6)}$$

two negatives make positive

13) $y = \frac{5}{8}x - 9$ in standard form?

$$Ax + By = C$$

$-\frac{5}{8}x \quad -\frac{5}{8}x$

in standard form x and y are "together" on one side of the equation, and no coefficients are fractions. $\left(-\frac{5}{8}x + y = -9\right) \cdot 8$

$$\boxed{-5x + 8y = -72}$$

multiply eq. by 8 to remove fraction

14) x and y intercepts?

$-4x - 6y = 24$

x-int is when $y = 0$

y-int is when $x = 0$

x-int

$-4x - 6 \cdot 0 = 24$

$\frac{-4x}{-4} = \frac{24}{-4}$

$\boxed{x = -6}$

y-int

$-4 \cdot 0 - 6y = 24$

$\frac{-6y}{-6} = \frac{24}{-6}$

$\boxed{y = -4}$

15) Equation of a line perpendicular to $y = \frac{1}{2}x + 3$ that passes through $(3, 3)$ (x, y)

$m = \frac{1}{2} \xrightarrow{\text{perp slope}} m = -\frac{2}{1}$

the slopes of perp lines are opposite reciprocal

$y = mx + b$

$3 = -2 \cdot 3 + b$

$3 = -6 + b$

$+6 \quad +6$

$9 = b$

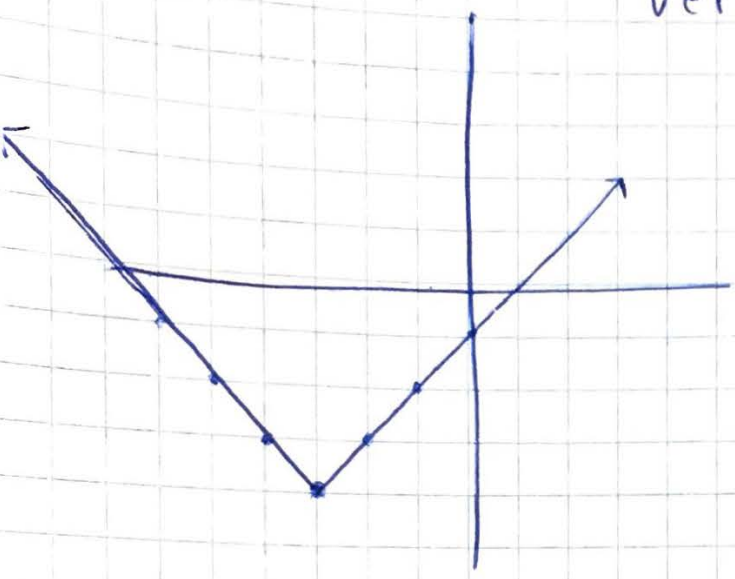
the equation of the perp. line is $\boxed{y = -2x + 9}$

16) Graph $y = |x+3| - 4$

no coefficient, therefore it is 1

vertex $(-3, -4)$

$a = \frac{1}{1}$



17) $y = 7\,|x-3| - 6$

- 7: stretch by factor 7
- $|x-3|$: right 3 (inside number changes sign)
- -6: down 6

18) Graph $2x - 2y \leq -4$

$-2x \quad\quad -2x$

solve for y: $\frac{-2y}{-2} \leq \frac{-2x}{-2} - \frac{4}{-2}$

$y \geq x + 2$

↑ there is equality therefore the Line is solid and solution region is above the Line