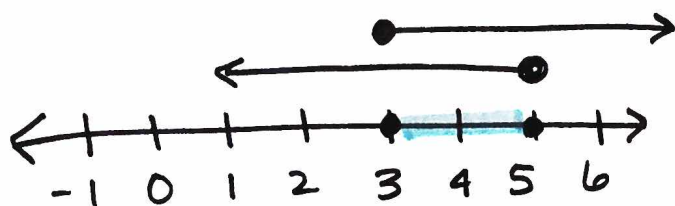


— §13.2 (cont'd)

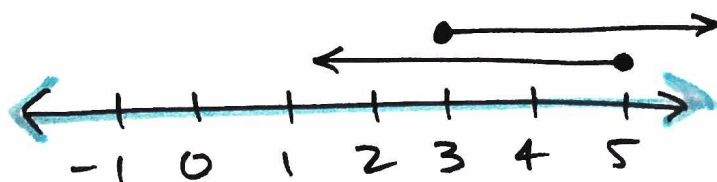
(16) $x \geq 3 \cap x \leq 5$



$\{x \mid 3 \leq x \leq 5\}$

"the set of all values x such that $3 \leq x \leq 5$ "

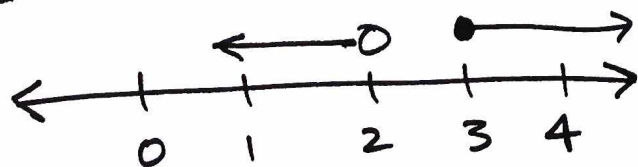
(17) $x \geq 3 \cup x \leq 5$



$\{x \mid x \in \mathbb{R}\}$

"the set of all values x such that x is an element of $\mathbb{R}$ "

(18) $x \geq 3 \cup x < 2$

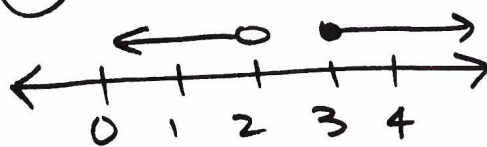


$\{x \mid x < 2 \text{ or } x \geq 3\}$

"such that"

| or :

(19) $x \geq 3 \cap x < 2$



$\{ \}$

§13.3 Writing Eqns. of Lines

$\perp$: slopes multiply to -1

$\parallel$: slopes are same

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

* point-slope: $y - y_1 = m(x - x_1)$

* slope-intercept: $y = mx + b$

* standard form: $Ax + By = C$

$\rightarrow$ ① $A \in \mathbb{W}$ ② $B, C \in \mathbb{Z}$

① eqn. in standard form. $\perp$ to $2x + 3y = 5$
thru $(1, 3)$

$$2x + 3y = 5$$

$$3y = -2x + 5$$

$$y = -\frac{2}{3}x + \frac{5}{3}$$

$\perp$: $\frac{3}{2}$

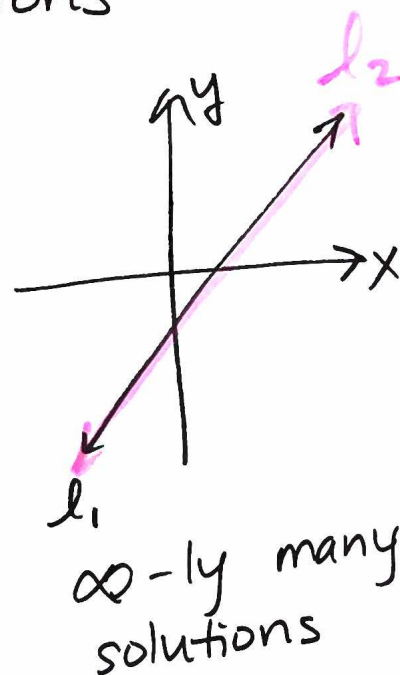
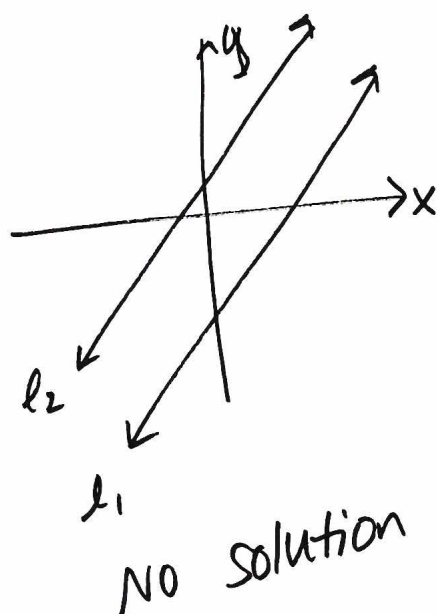
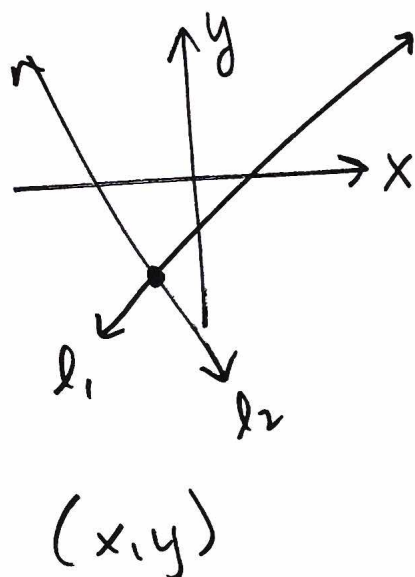
$$2(y - 3) = \left(\frac{3}{2}(x - 1)\right) 2$$

$$2y - 6 = 3(x - 1)$$

$$2y - 6 = 3x - 3$$

$$\boxed{3x - 2y = -3}$$

3.4 Solving Systems of Equations



$$\begin{aligned} \textcircled{1} \quad & 6x + 15y = -12 \\ & 3(-2x - 5y) = (9)3 \end{aligned}$$

$$\begin{array}{r} 6x + 15y = -12 \\ -6x - 15y = 27 \\ \hline 0 \neq 15 \end{array}$$

if your method for solving a system results in an eqn. that is NOT TRUE, then the lines are $\parallel$ and the system does not have a solution.

$\{ \}$

$$\textcircled{2} \quad 5x + 3y = 20$$

$$5\left(-x - \frac{3}{5}y\right) = (-4)5$$

$$\begin{array}{r} 5x + 3y = 20 \\ -5x - 3y = -20 \\ \hline \end{array}$$

$$0 = 0$$

if your method for solving a system results in an eqn. that is always true, then the 2 lines in the system are the same and there are ∞ -ly many solutions.

*represent one variable in terms of the other (x, y)

$$5x + 3y = 20$$

$$3y = -5x + 20$$

$$y = -\frac{5}{3}x + \frac{20}{3}$$

$$\boxed{\left\{ (x, y) \mid \left(x, -\frac{5}{3}x + \frac{20}{3} \right) \right\}}$$

$$-x - \frac{3}{5}y = -4$$

$$-x = \frac{3}{5}y - 4$$

$$x = -\frac{3}{5}y + 4$$

$$\{(x, y) | (-\frac{3}{5}y + 4, y)\}$$