

CHAPTER 3

Solutions

19) solve by graphing

a)
$$\begin{array}{r} -2x - y = 3 \\ +2x \quad +2x \end{array}$$

change all signs

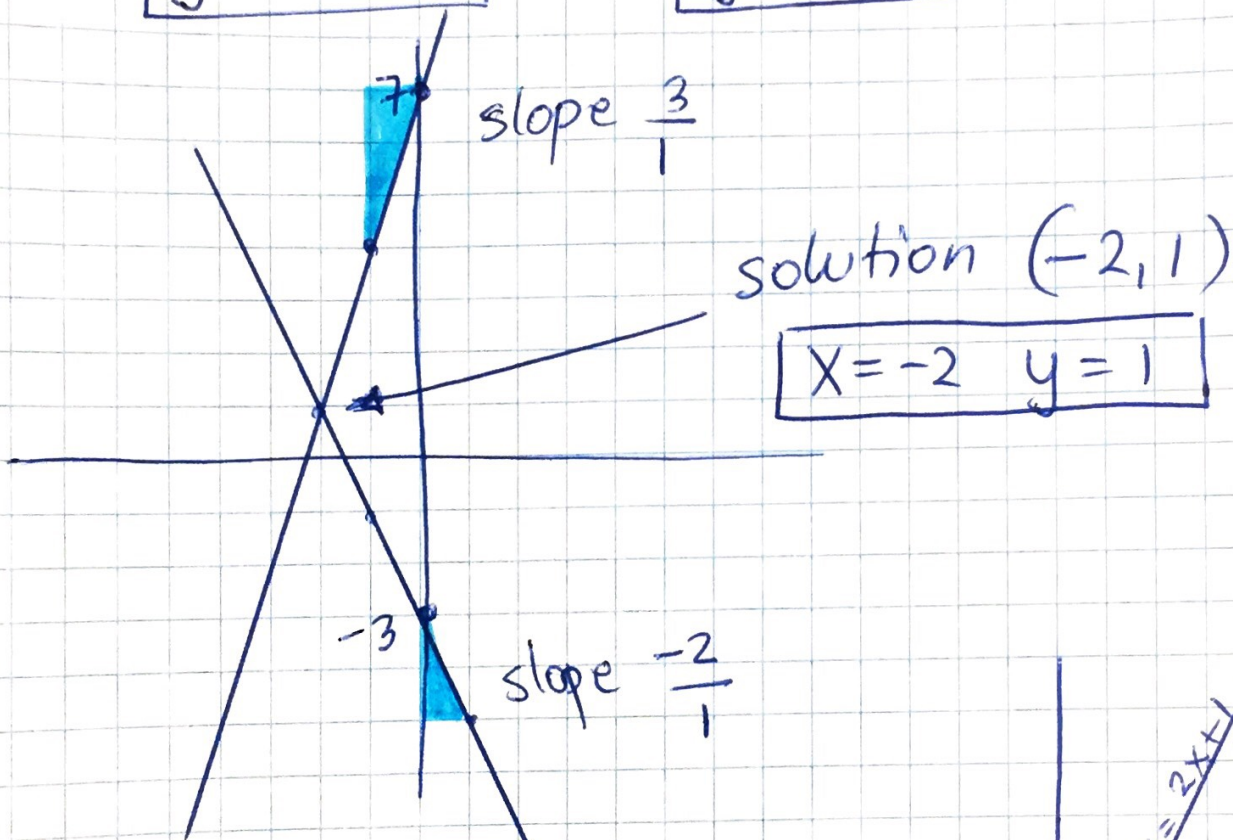
$$-y = 2x + 3$$

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

$$\begin{array}{r} 3x - y = -7 \\ -3x \quad -3x \end{array}$$

$$-y = -3x - 7$$

$$\boxed{y = 3x + 7}$$



b)
$$\boxed{y = 2x + 1}$$

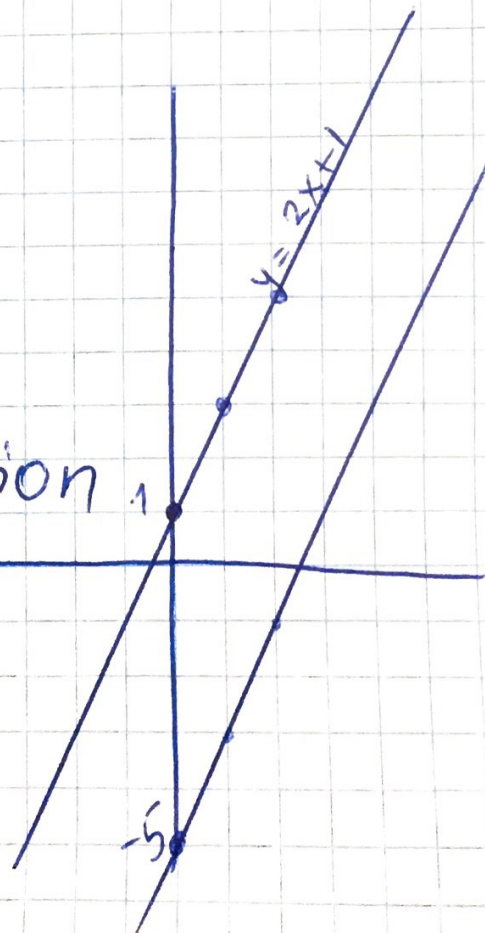
$$\begin{array}{r} 4x - 2y = 10 \\ -4x \quad -4x \end{array}$$

$$\begin{array}{r} -2y = -4x + 10 \\ \underline{-2} \quad \underline{-2} \quad \underline{-2} \end{array}$$

$$\boxed{y = 2x - 5}$$

NO solution

parallel lines
(equal slopes)



20) ELIMINATION

$$\begin{array}{r} -3x + 5y = -13 \\ 2x - 5y = 12 \\ \hline \end{array}$$

$$-x = -1$$

$$\boxed{x = 1}$$

$$-3 \cdot 1 + 5y = -13$$

$$\begin{array}{r} -3 + 5y = -13 \\ +3 \quad +3 \end{array}$$

$$\frac{5y}{5} = \frac{-10}{5}$$

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

since there are already opposites ($5y$ and $-5y$) add two equations to eliminate the variable y , and solve for x

21) ELIMINATION

$$(5x + 2y = -8) \cdot 3$$

$$(4x + 3y = 2) \cdot -2$$

$$15x + 6y = -24$$

$$\begin{array}{r} -8x - 6y = -4 \\ \hline \end{array}$$

$$\begin{array}{r} 7x = -28 \\ \hline 7 \end{array}$$

$$\boxed{x = -4}$$

$$5(-4) + 2y = -8$$

$$\begin{array}{r} -20 + 2y = -8 \\ +20 \quad +20 \end{array}$$

$$2y = 12 \quad \boxed{y = 6}$$

No opposites, so we must create them by multiplying one or both equations by a number

22) Substitution

$$y = x + 1$$

$$2x + y = 7$$

$$2x + x + 1 = 7$$

$$3x + 1 = 7$$

$$3x = 6$$

$$x = 2$$

$$y = 2 + 1$$

$$y = 3$$

23) substitution

$$x - 2y = 3$$

$$3x + y = -5$$

$$x = 2y + 3$$

$$3(2y + 3) + y = -5$$

$$6y + 9 + y = -5$$

$$7y + 9 = -5$$

$$7y = -14$$

$$y = -2$$

since x is single (no coeff.)
solve for x , then
substitute into x for
the second equation.

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

$$= -4 + 3$$

$$x = -1$$