

CH 3 HOMEWORK (GRAPH PAPER REQUIRED)

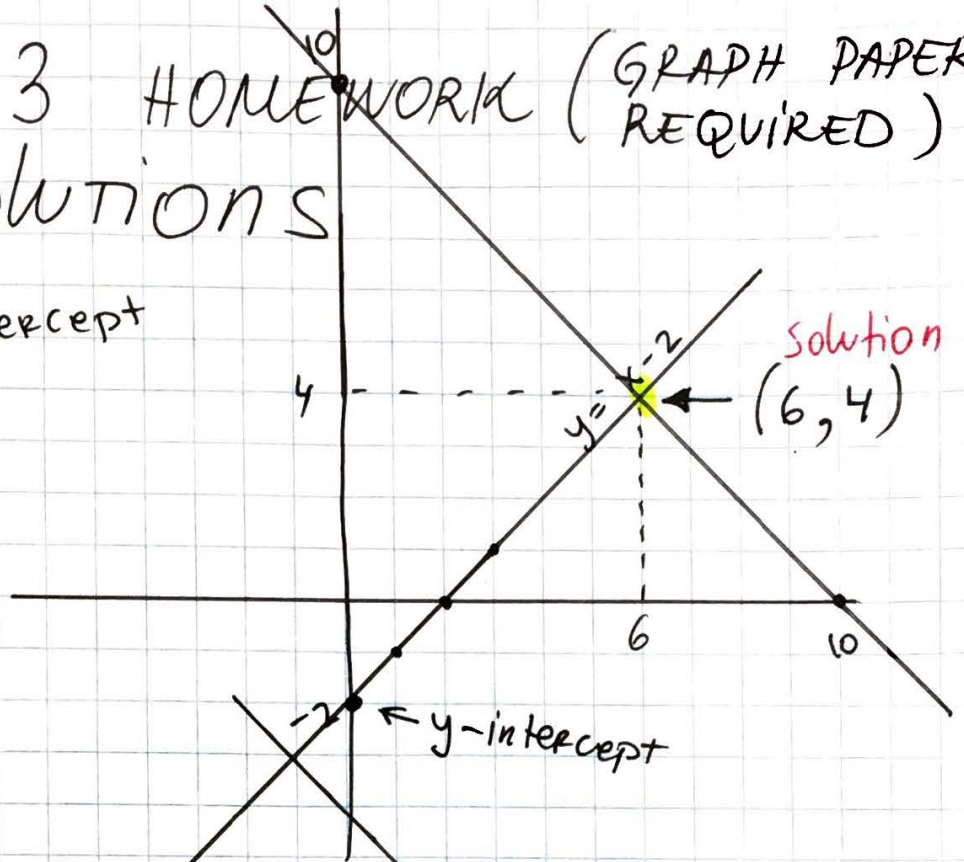
SOLUTIONS

PRACTICE 3-1

1) $y = \frac{1}{2}x - 2 \leftarrow y\text{-intercept}$

$x + y = 10$

$x = 10$ (when $y = 0$) $y = 10$ (when $x = 0$)

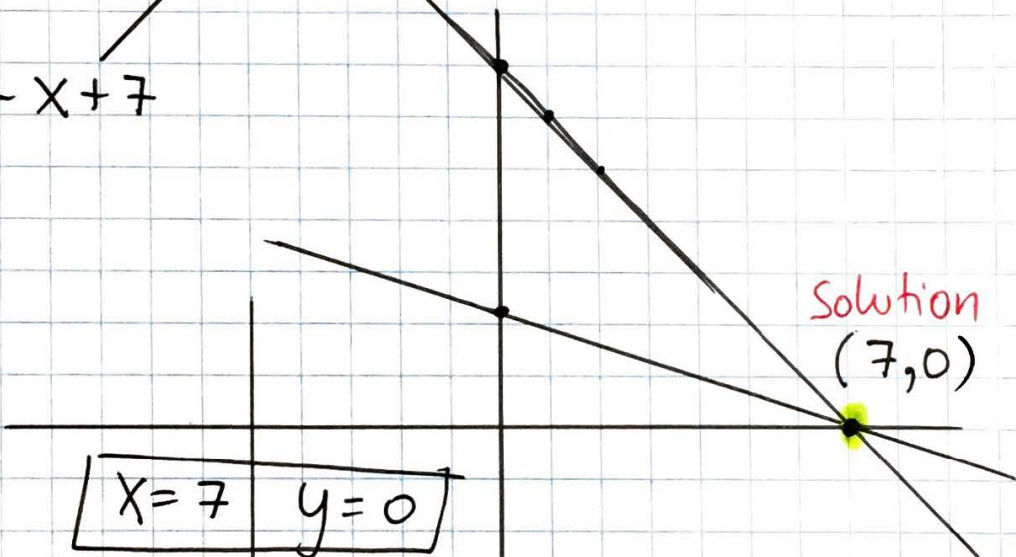


2) $y = 7 - x$ or $-x + 7$

$x + 3y = 7$

$x = 7$ $3y = 7$
 $y = \frac{7}{3}$
 or $2\frac{1}{3}$

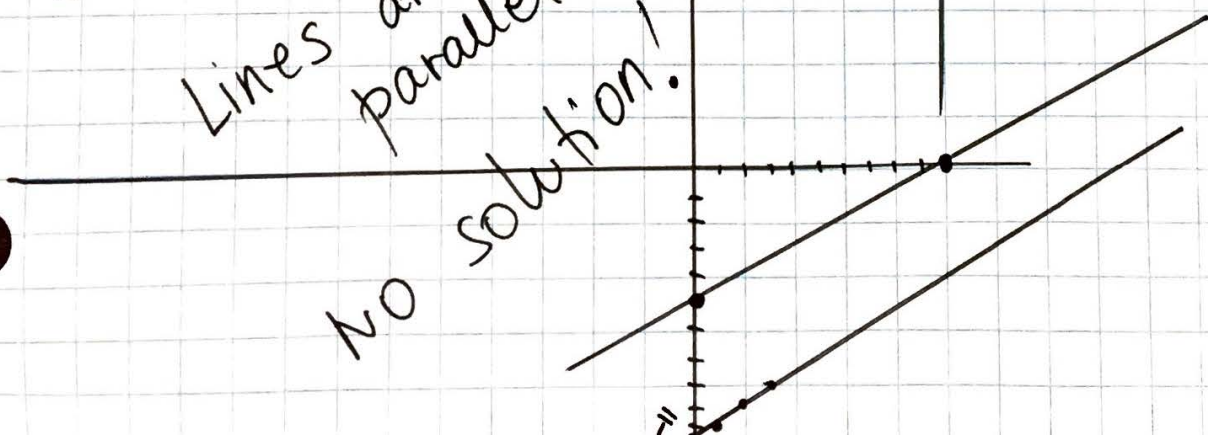
$x = 7$ $y = 0$



3) $x - 2y = 10$ $x\text{-int} = 10$
 $y\text{-int} = -5$

$y = x - 11$

Lines are parallel
 No solution!



4) $5x + y = 11$

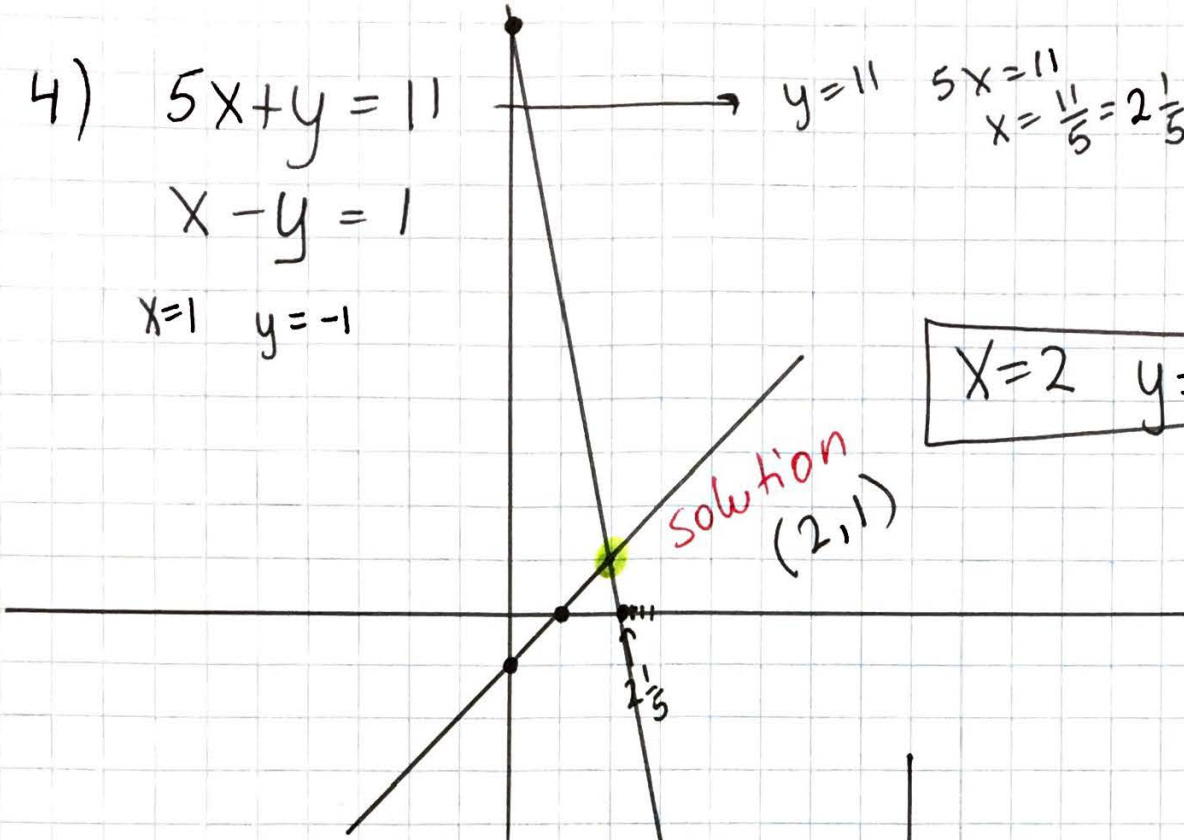
$x - y = 1$

$x = 1 \quad y = -1$

$y = 11$ $5x = 11$
 $x = \frac{11}{5} = 2\frac{1}{5}$

$x = 2 \quad y = 1$

Solution
(2, 1)



5) $x + y = -1$

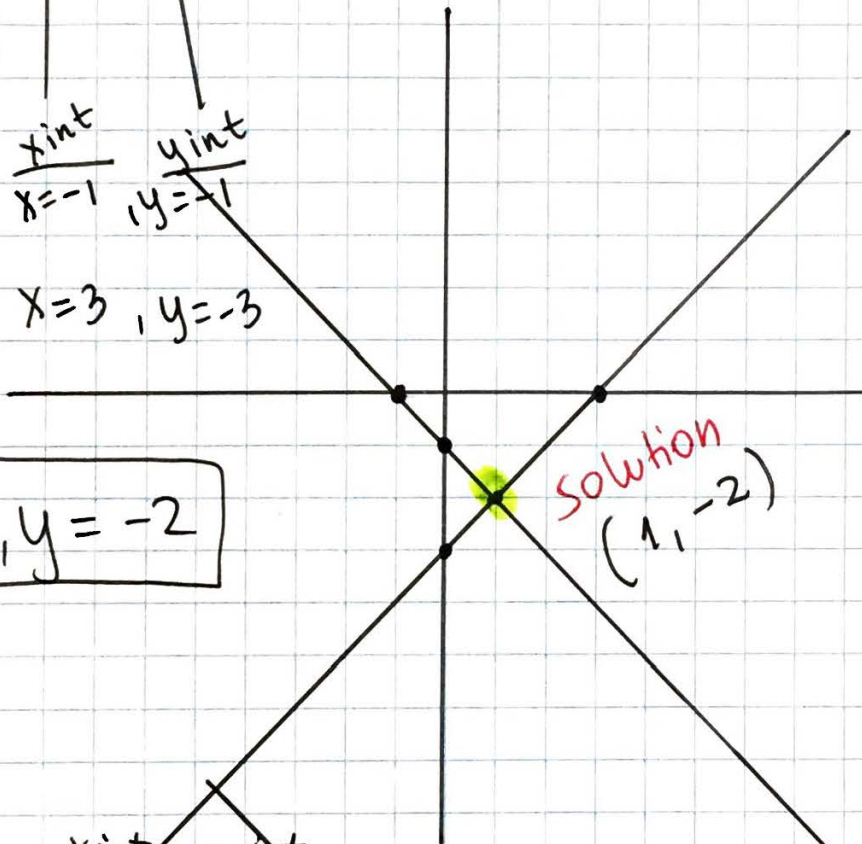
$x - y = 3$

$x = -1 \quad y = -1$

$x = 3 \quad y = -3$

$x = 1 \quad y = -2$

Solution
(1, -2)



6) $x - y = -1$

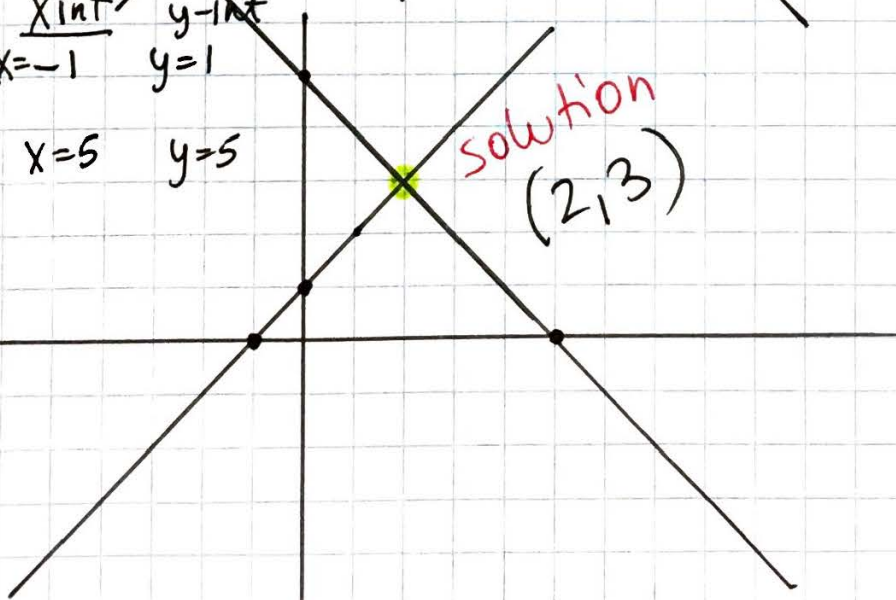
$2x + 2y = 10$

$x = -1 \quad y = 1$

$x = 5 \quad y = 5$

Solution
(2, 3)

$x = 2 \quad y = 3$



7) $4x + 3y = -16$

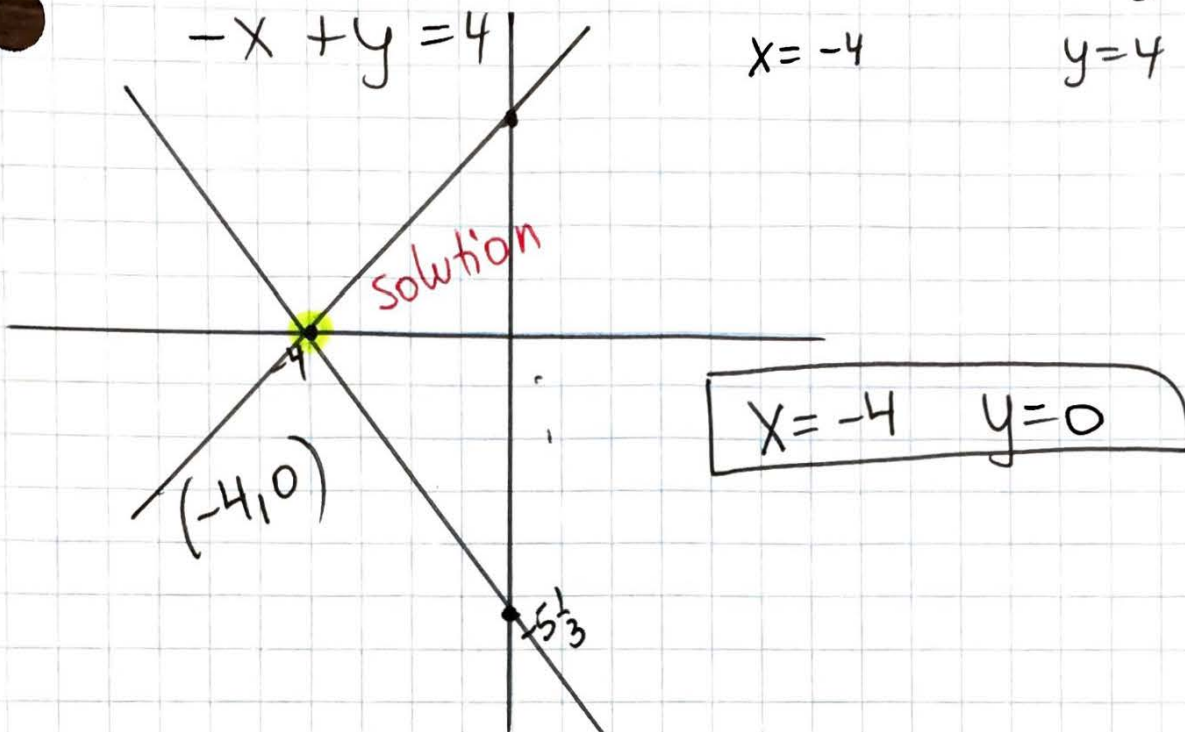
$-x + y = 4$

$\frac{x\text{-int}}{x = -4}$

$x = -4$

$\frac{y\text{-int}}{y = -\frac{16}{3} = -5\frac{1}{3}}$

$y = 4$



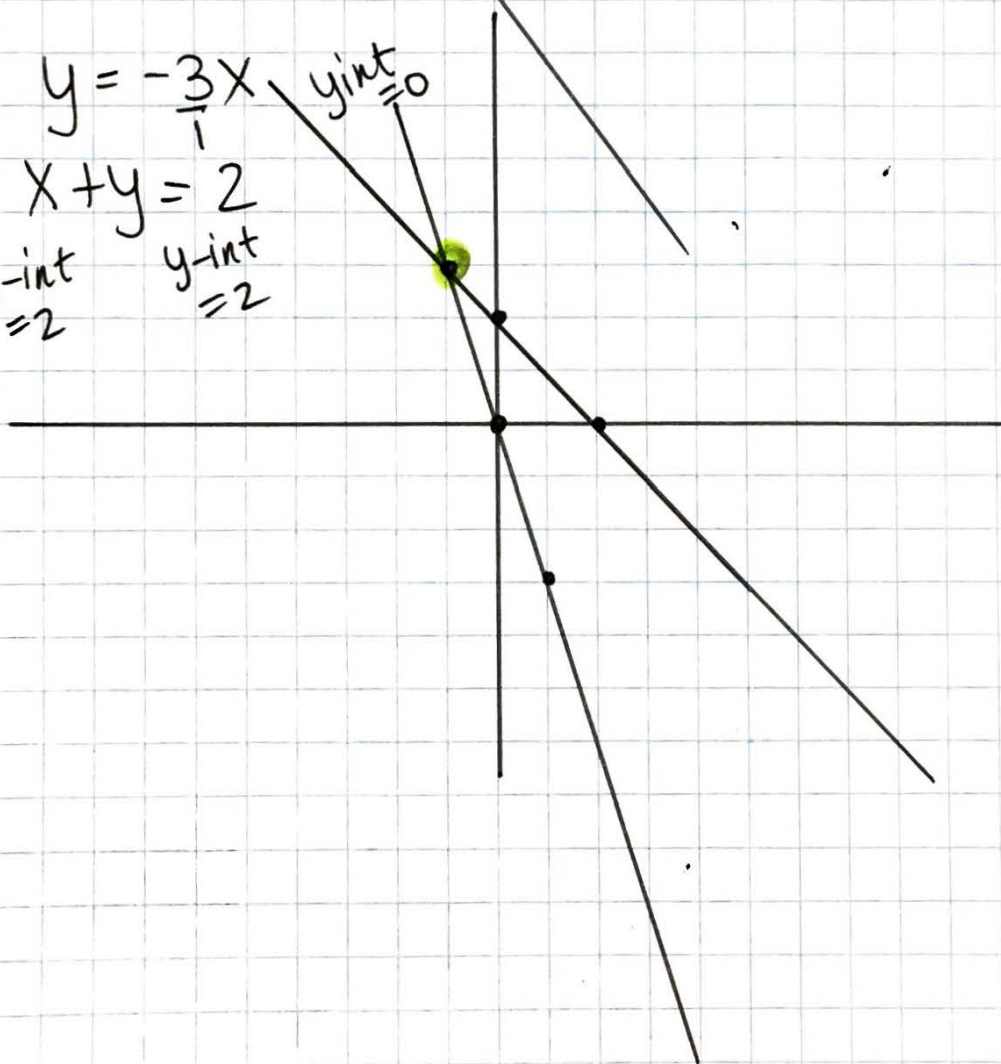
8) $y = -\frac{3}{1}x$

$x + y = 2$

$x\text{-int} = 2$

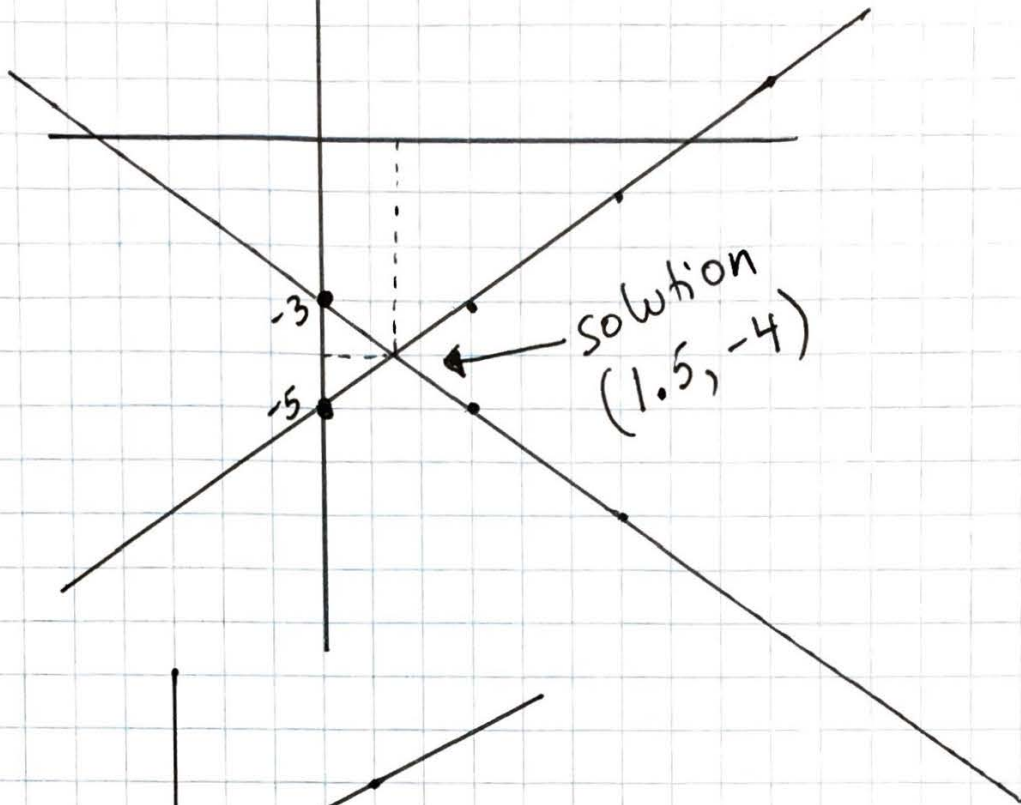
$y\text{-int} = 2$

$y\text{-int} = 0$



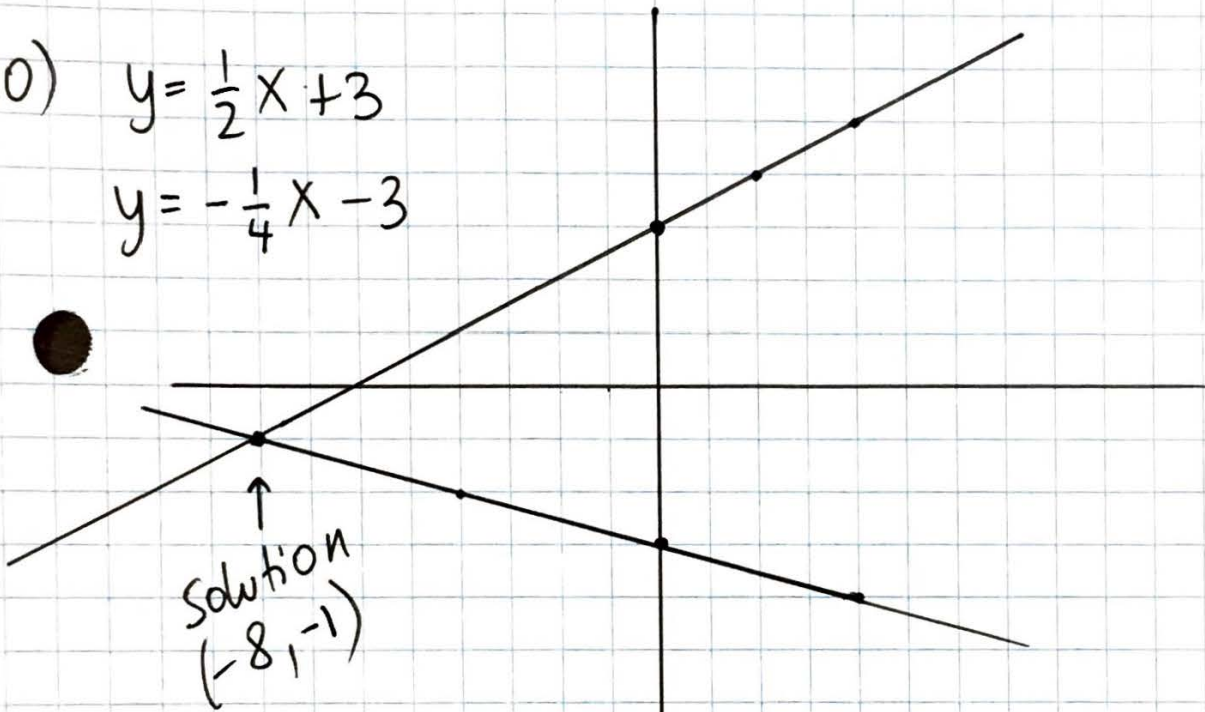
9) $y = \frac{2}{3}x - 5$

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



10) $y = \frac{1}{2}x + 3$

$y = -\frac{1}{4}x - 3$

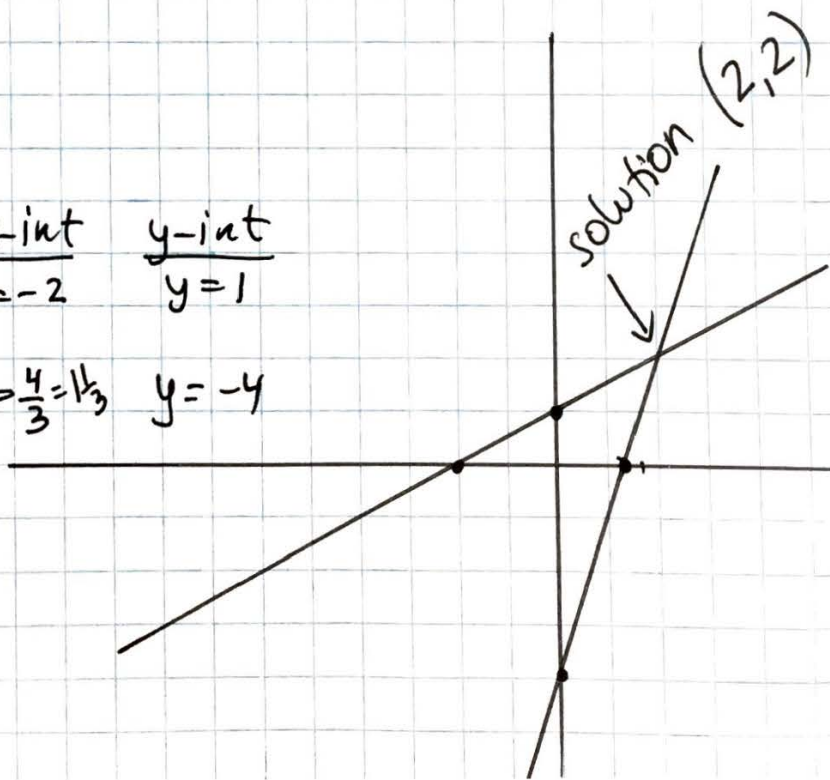


11) $2x - 4y = -4$

$3x - y = 4$

$x\text{-int}$	$y\text{-int}$
$x = -2$	$y = 1$

$x = \frac{4}{3} = 1\frac{1}{3}$	$y = -4$
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12) $x + y = 6$

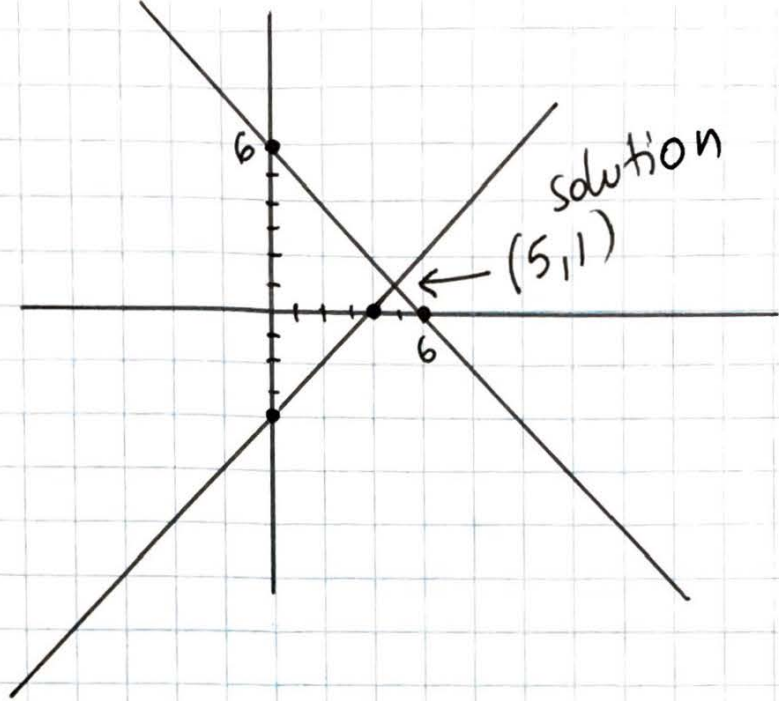
$x - y = 4$

$\frac{x\text{-int}}{x=6}$

$\frac{y\text{-int}}{y=6}$

$x=4$

$y=-4$



13) x - student tickets

$x + y = 85$ count

y - adult tickets

$5x + 10y = 600$ money

solve using calculator graph (numbers are too large)

$y = -x + 85$

$5x + 10y = 600$

MENU → 5 - enter functions

$\frac{10y}{10} = \frac{-5x + 600}{10}$

$y = -\frac{1}{2}x + 60$

→ Enter or F6 (draw)

→ F5 → F5

$x = 50, y = 35$

14) x - small bags

$x + y = 6$ count

y - large bags

$5x + 8y = 45$ money

$y = -x + 6$

$\frac{8y}{8} = \frac{-5x + 45}{8}$

$y = -\frac{5}{8}x + \frac{45}{8}$

calculator graph

$x = 1, y = 5$

PRACTICE 3-2

SUBSTITUTION METHOD

1)

$$4x + 2y = 7$$

$$y = 5x \quad \text{replace (substitute for } y)$$

$$4x + 2(5x) = 7$$

$$4x + 10x = 7$$

$$\frac{14x}{14} = \frac{7}{14}$$

$$x = \frac{1}{2}$$

$$y = 5x$$

$$y = 5 \cdot \frac{1}{2}$$

$$y = \frac{5}{2}$$

2)

$$x + 12y = 68$$

$$x = 8y - 12$$

$$(8y - 12) + 12y = 68$$

$$\cancel{8y} - 12 + 12y = 68$$

$$\frac{20y}{20} = \frac{80}{20}$$

$$y = 4$$

$$x = 8y - 12$$

$$x = 8 \cdot 4 - 12$$

$$= 32 - 12$$

$$x = 20$$

3)

$$y = 2x - 1$$

$$3x - y = -1$$

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

$$3x - 2x + 1 = -1$$

$$x + 1 = -1$$

$$x = -2$$

$$y = 2x - 1$$

$$y = 2(-2) - 1$$

$$-4 - 1$$

$$y = -5$$

4)

x - number of \$1 bills
y - number of \$5 bills

solve for x or y

$$x = -y + 15$$

then substitute

$$x + y = 15 \quad \text{count}$$

$$1x + 5y = 47 \quad \text{money}$$

$$-y + 15 + 5y = 47$$

$$4y + 15 = 47$$

$$4y = 32$$

$$y = 8$$

$$x = -y + 15$$

$$x = -8 + 15$$

$$x = 7$$

5) $X + y = 20$ TOTAL number of questions
 $2X + 6y = 60$ TOTAL time per each type of question
 $y = -X + 20$

$$2X + 6(-X + 20) = 60$$

$$2X - 6X + 120 = 60$$

$$\frac{-4X}{-4} = \frac{-60}{-4}$$

$$\boxed{X = 15}$$

 multiple choice

$$y = -X + 20$$

$$y = -15 + 20$$

$$\boxed{y = 5}$$

 extended response

Elimination method

6) $X + y = 12$
 $X - y = 2$

 $2X = 14$
 $\boxed{X = 7}$

$$\begin{array}{r} 7 + y = 12 \\ -7 \quad -7 \end{array}$$

$$\boxed{y = 5}$$

7) $(4r + 2s = 4) \cdot 1$
 $6r + 2s = 8$

 $-4r - 2s = -4$
 $6r + 2s = 8$

 $2r = 4$
 $r = 2$

$$\begin{array}{r} 4r + 2s = 4 \\ 4 \cdot 2 + 2s = 4 \end{array}$$

$$\begin{array}{r} 8 + 2s = 4 \\ -8 \quad -8 \end{array}$$

$$2s = -4$$

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

$$\begin{array}{l}
 8) \quad 3x + 2y = 6 \\
 \quad \quad 3x + 3 = 3 \quad (y) \\
 \hline
 \quad \quad 3x + 2y = 6 \\
 \quad \quad (3x - y = -3) \cdot 2 \\
 \quad \quad \quad 3x + 2y = 6 \\
 \quad \quad \quad 6x - 2y = -6 \\
 \hline
 \quad \quad 9x = 0 \\
 \hline
 \quad \quad \boxed{x = 0}
 \end{array}$$

$$\begin{array}{l}
 3x + 2y = 6 \\
 3 \cdot 0 + 2y = 6 \\
 2y = 6 \\
 \boxed{y = 3}
 \end{array}$$

$$\begin{array}{l}
 9) \quad (5a - 2b = -19) \cdot 2 \\
 \quad \quad (2a + 3b = 0) \cdot -5 \\
 \hline
 \quad \quad 10a - 4b = -38 \\
 \quad \quad -10a - 15b = 0 \\
 \hline
 \quad \quad -19b = -38 \\
 \quad \quad \quad \frac{-19b}{-19} = \frac{-38}{-19} \\
 \quad \quad \quad \boxed{b = 2}
 \end{array}$$

$$\begin{array}{l}
 5a - 2b = -19 \\
 5a - 2 \cdot 2 = -19 \\
 5a - 4 = -19 \\
 5a = -15 \\
 \boxed{a = -3}
 \end{array}$$

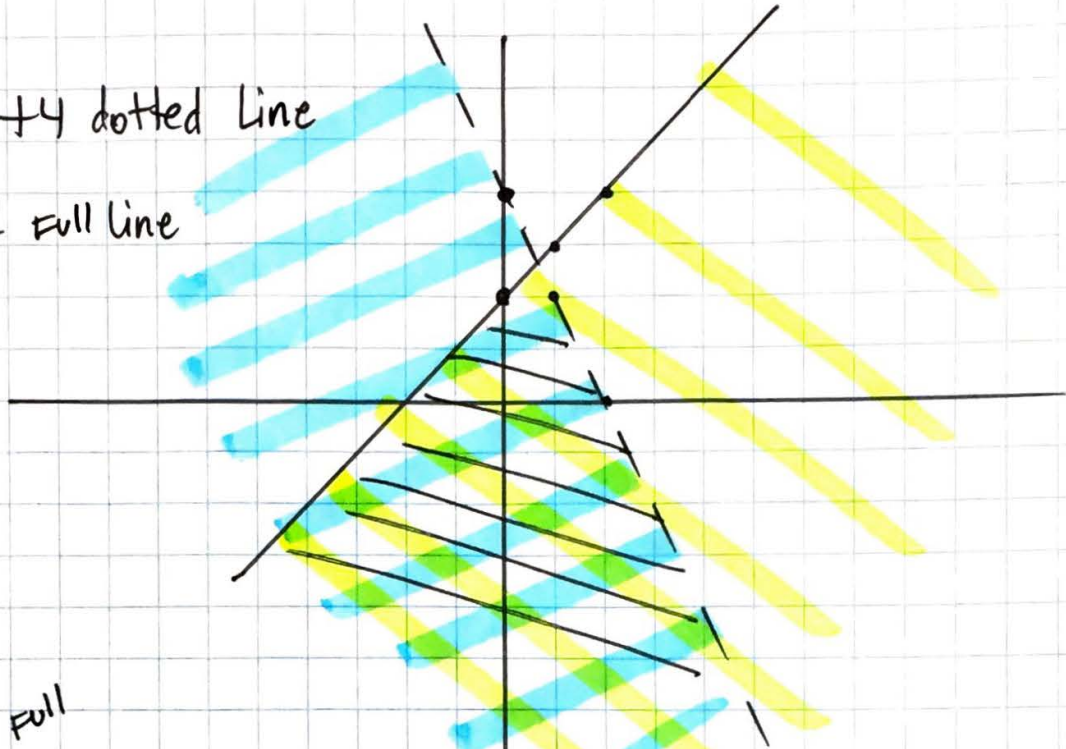
$$\begin{array}{l}
 10) \quad (7x + 2y = -8) \cdot 4 \\
 \quad \quad 4x - 8y = 0 \\
 \hline
 \quad \quad 28x + 8y = -32 \\
 \quad \quad 4x - 8y = 0 \\
 \hline
 \quad \quad 32x = -32 \\
 \quad \quad \quad \boxed{x = -1}
 \end{array}$$

$$\begin{array}{l}
 7(-1) + 2y = -8 \\
 -7 + 2y = -8 \\
 \quad \quad \quad +7 \\
 \quad \quad 2y = -1 \\
 \quad \quad \quad \boxed{y = -\frac{1}{2}}
 \end{array}$$

PRACTICE 3-3

this MUST be done
ON GRAPH PAPER!!!

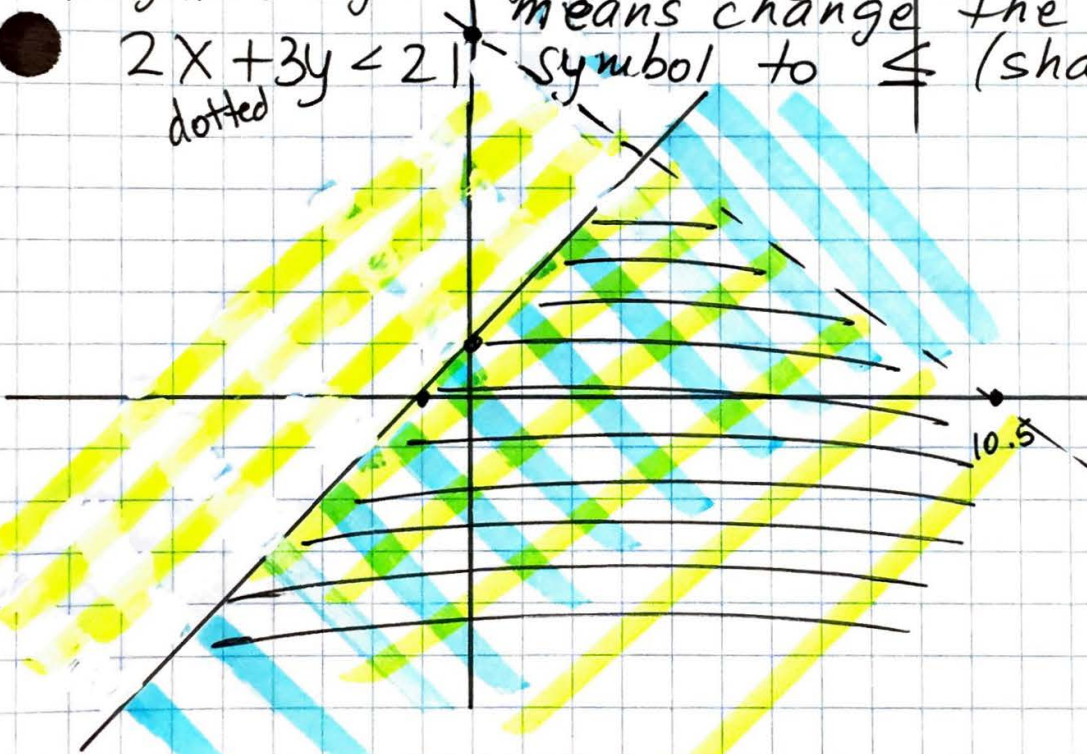
1) $y < -2x + 4$ dotted line
 $y \leq x + 2$ full line



2) $x - y \geq 1$ Full

Negative sign in front of y means change the inequality symbol to \leq (shade below)

$2x + 3y < 21$ dotted



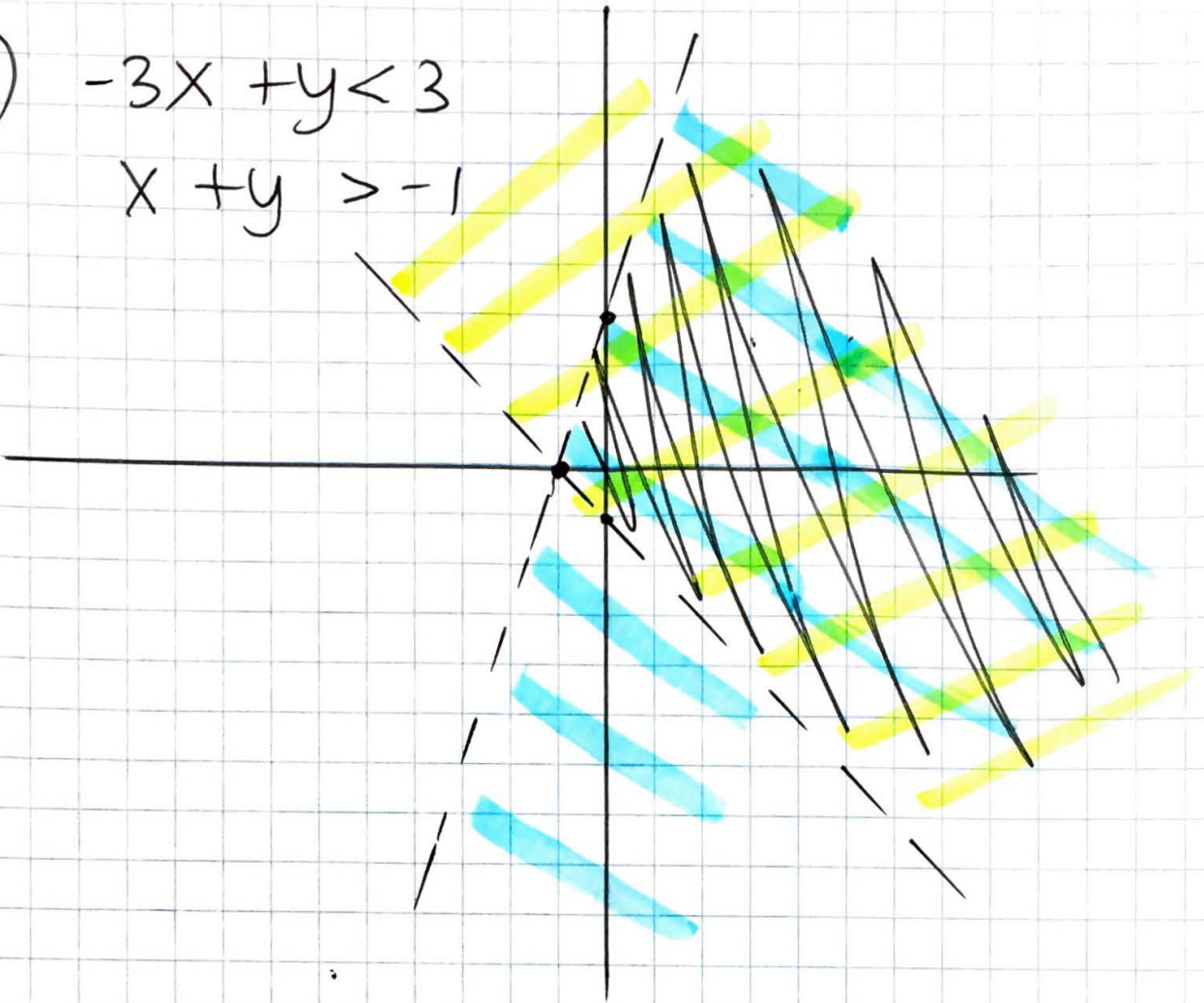
$x_{int} = 1$
 $y_{int} = -1$

$x_{int} = 10.5$

$y_{int} = 7$

$$3) \quad -3x + y < 3$$

$$x + y > -1$$



PRACTICE 3-6

$$1) \quad \begin{bmatrix} -4 & 1 & -3 \\ 2 & 1 & 0 \end{bmatrix}$$

ANSWER: $\begin{bmatrix} 1 & 0 & \frac{1}{2} \\ 0 & 1 & -1 \end{bmatrix}$ $x = \frac{1}{2}$
 $y = -1$

$$3) \quad \begin{bmatrix} 1 & -2 & -10 \\ -2 & -3 & -1 \end{bmatrix}$$

$$x = -4 \quad y = 3$$

$$2) \quad \begin{bmatrix} 3 & 2 & -2 & 9 \\ 5 & 1 & -3 & -7 \\ 1 & 4 & 3 & 5 \end{bmatrix}$$

$$x = -\frac{213}{29} \quad y = \frac{244}{29} \quad z = -\frac{206}{29}$$

$$4) \quad \begin{bmatrix} 2 & 5 & -11 \\ -1 & 1 & 2 \end{bmatrix}$$

$$x = -3 \quad y = -1$$