

Solve & graph

$$3x - 4 \geq 12$$

$$+4$$

$$+4$$

$$3x \geq 16$$

$$x \geq 5.\bar{3}$$

check $x=6$

$$3(6) - 4 \geq 12$$

$$18 - 4 \geq 12$$

$$14 \geq 12 \checkmark$$

$$5 - 7x < 33$$

$$-5$$

$$-5$$

$$-7x < 28$$

$$\frac{-7x}{-7} < \frac{28}{-7}$$

$$x < -4$$

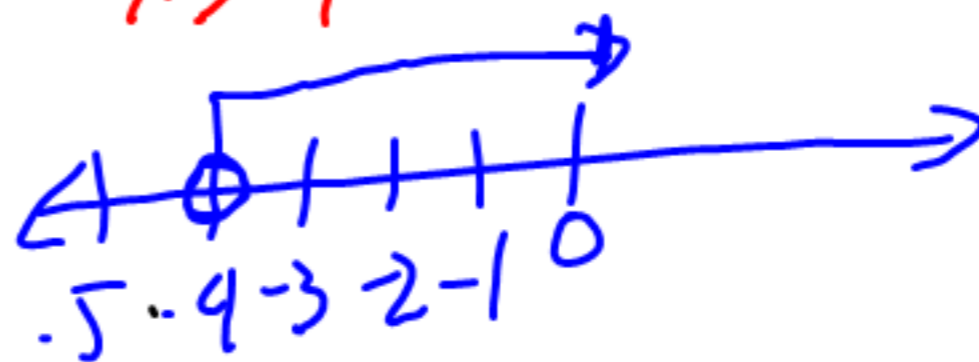
$$x > -4$$

check $x=-5$

$$5 - 7(-5) < 33$$

$$5 - 1 - 35 < 33$$

$$-31 < 33$$



$$2x + 7y > 42$$

$$\Rightarrow 7y > 42 - 2x$$

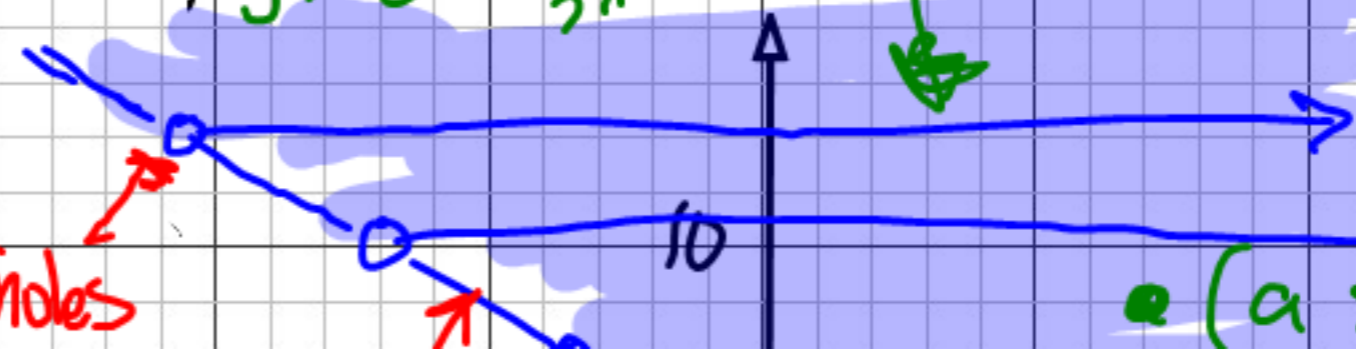
$$y > 6 - \frac{2}{7}x$$

feasible region or solution

$$y=0 \quad x > 21$$

$$y=2 \quad x > 14$$

holes



$$2x + 7y > 42$$

$$\Rightarrow 7y > 42 - 2x$$

$$y > 6 - \frac{2}{7}x$$

feasible region or solution

$$y=0 \quad x > 21$$

$$y=2 \quad x > 14$$

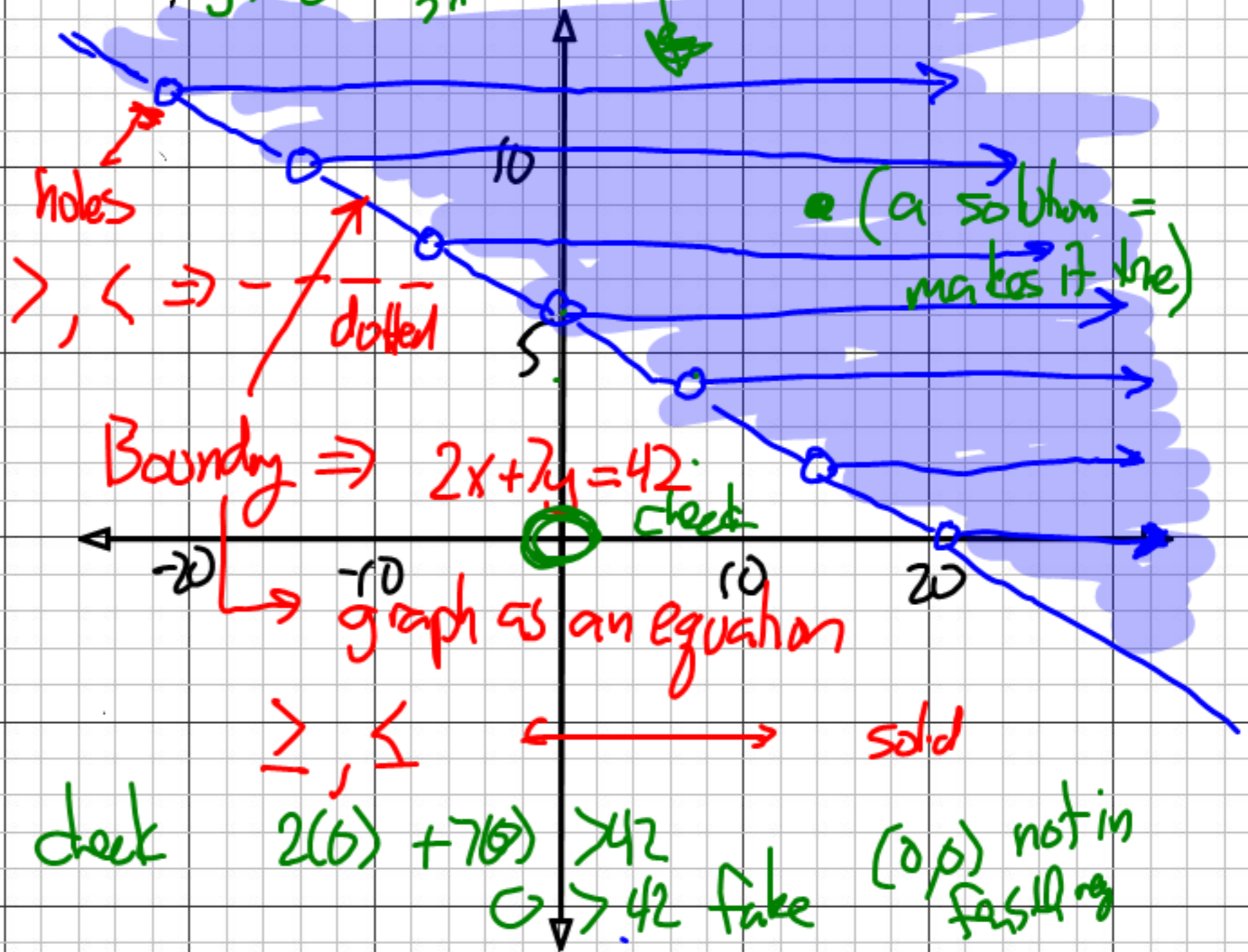
$$y=4 \quad x > 7$$

$$y=6 \quad x > 0$$

$$y=8 \quad x > -7$$

$$y=10 \quad x > -14$$

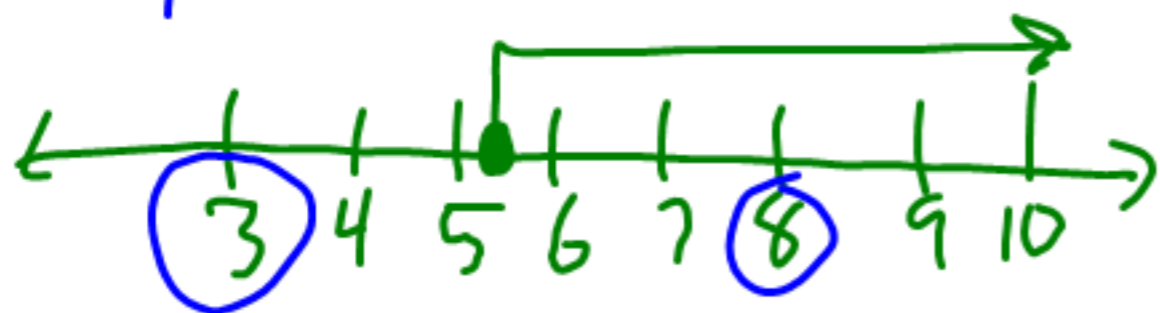
$$y=12 \quad x > -21$$



Solve & graph

$$\begin{array}{r}
 3(8) - 4 \geq 12 \\
 3x - 4 \geq 12 \\
 +4 \quad +4 \\
 3x \geq 16 \\
 \frac{3x}{3} \geq \frac{16}{3} \\
 x \geq 5.\bar{3}
 \end{array}$$

$3(3) - 4 \geq 12$
 $5 \geq 12$



$$2x + 7y > 42$$

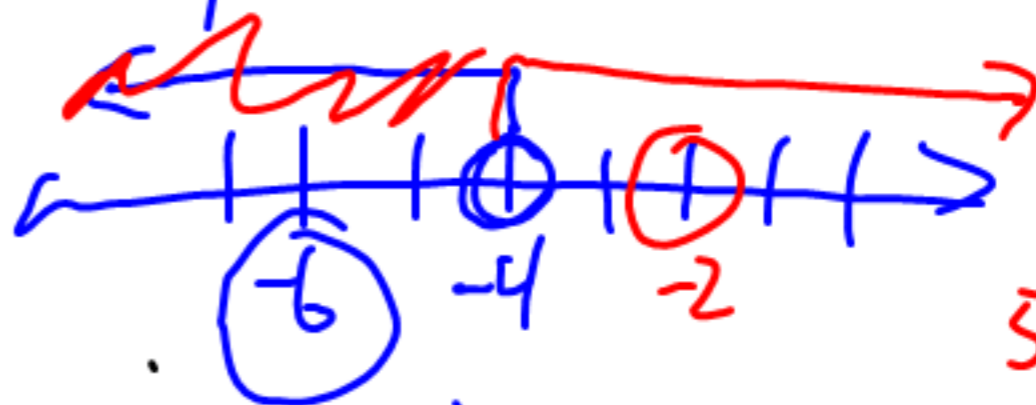
$$\begin{array}{r}
 5 - 7x < 33 \\
 -5 \quad -5 \\
 \hline
 -7x < 28
 \end{array}$$

$$\begin{array}{r}
 -7x < 28 \\
 \frac{-7x}{-7} < \frac{28}{-7}
 \end{array}$$

opp

4
-4

$$\begin{array}{l}
 \cancel{x < 4} \\
 x > -4
 \end{array}$$



$$\begin{array}{l}
 5 - 7(-6) < 33 \\
 5 + 42 < 33 \\
 47 < 33
 \end{array}$$

$$\begin{array}{l}
 5 - 7(-) \\
 5 + 14
 \end{array}$$

$$y = 10 - 5x$$

$$y = -2 + 3(x - 7)$$

$$y = 10 - 5(4.125)$$

$$y = 10 - 20.625$$

$$y = -10.625$$

check

$$y = -2 + 3(4.125 - 7)$$

$$y = -2 + 3(-2.875)$$

$$y = -2 - 8.625$$

$$y = -10.625$$

$$10 - 5x = -2 + 3(x - 7)$$

$$10 - 5x = -2 + 3x - 21$$

$$10 - 5x = 3x - 23$$

$$\begin{array}{r} -10 \\ \hline \end{array}$$

$$-5x = 3x - 33$$

$$\begin{array}{r} -3x \\ \hline \end{array}$$

$$-8x = -33$$

$$\begin{array}{r} -8 \\ \hline \end{array}$$

$$x = 4.125$$

$$(4.125, -10.625)$$

Elimination

$$\begin{aligned} 3(4x - 7y) &= (-64)(3) \\ -4(3x - 5y) &= (-46)(-4) \end{aligned}$$

$$\begin{aligned} 12x - 21y &= -192 \\ -12x + 20y &= 184 \end{aligned}$$

$$\begin{aligned} -y &= -8 \\ y &= 8 \end{aligned}$$

$(-2, 8)$

$$\begin{aligned} 4x - 7(8) &= -64 \\ 4x - 56 &= -64 \\ +56 &+56 \\ \hline 4x &= -8 \\ \frac{4x}{4} &= \frac{-8}{4} \\ x &= -2 \end{aligned}$$

$$\begin{aligned} 3(-2) - 5(8) &= -46 \\ -6 - 40 &= -46 \\ -46 &= -46 \checkmark \end{aligned}$$

$$2x + 7y > 42$$

$$5 + 7 < 33 \\ 12 < 33 \checkmark$$

$$y = -4$$

$$2x + 7(-4) > 42$$

$$2x - 28 > 42$$

$$+28 \quad +28$$

$$2x > 70$$

$$x > 35$$

$$y = -2$$

$$y = 0$$

$$y = 2$$

$$y = 4$$

$$y = 6$$

$$y = 8$$

$$y = 10$$

$$y = 12$$

$$y = 14$$

$$2x + 7y > 42$$

Border

$>$
 $<$
 \geq
 \leq

--- dotted
— solid

$$y = -4 \quad x > 35$$

$$y = -2 \quad x > 28$$

$$y = 0 \quad x > 21$$

$$y = 2 \quad x > 14$$

$$y = 4 \quad x > 7$$

$$y = 6 \quad x > 0$$

$$y = 8 \quad x > -7$$

$$y = 10 \quad x > -14$$

$$y = 12 \quad x > -21$$

feasible region
solution

$$2x + 7y = 42$$

$(20, 5)$

$$2(0) + 7(0) > 42$$

$$0 > 42 \quad \text{false}$$

$$2(20) + 7(5) > 42$$
$$40 + 35 > 42$$

$$75 > 42$$

-20

-10

0

10

20

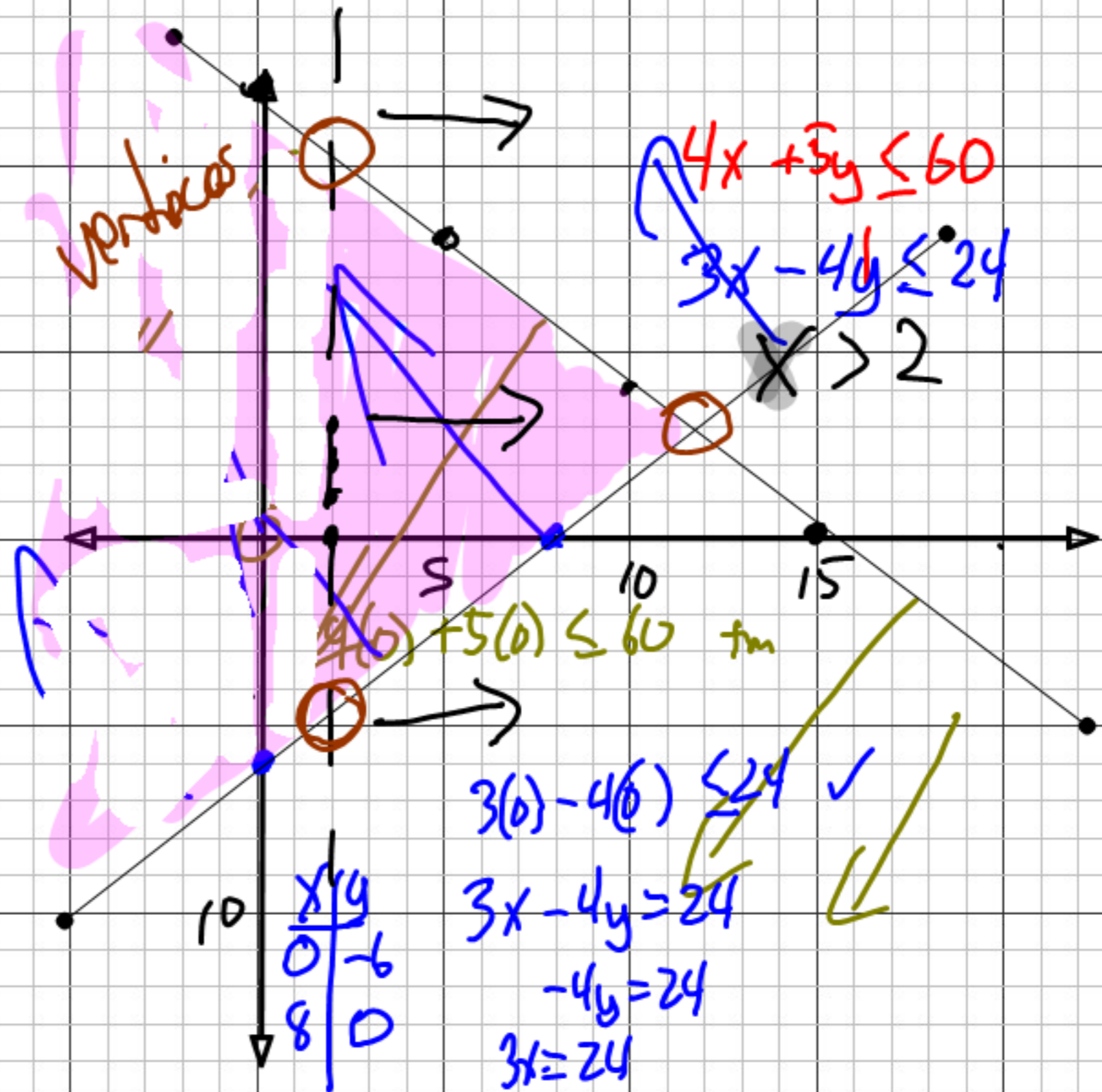
30

40

$(6, 0)$

graph $4x - 15y = 60$

$$\begin{array}{r}
 4x + 5y = 60 \\
 -4x \qquad -4x \\
 \hline
 5y = 60 - 4x \\
 \frac{5y}{5} = \frac{60 - 4x}{5} \\
 y = 12 - \frac{4}{5}x
 \end{array}$$



$$2x + 7y \geq 42$$

$$y = -4 \quad x > 35$$

$$y = -2 \quad x > 28$$

$$y = 0 \quad x > 21$$

$$y = 2 \quad x > 14$$

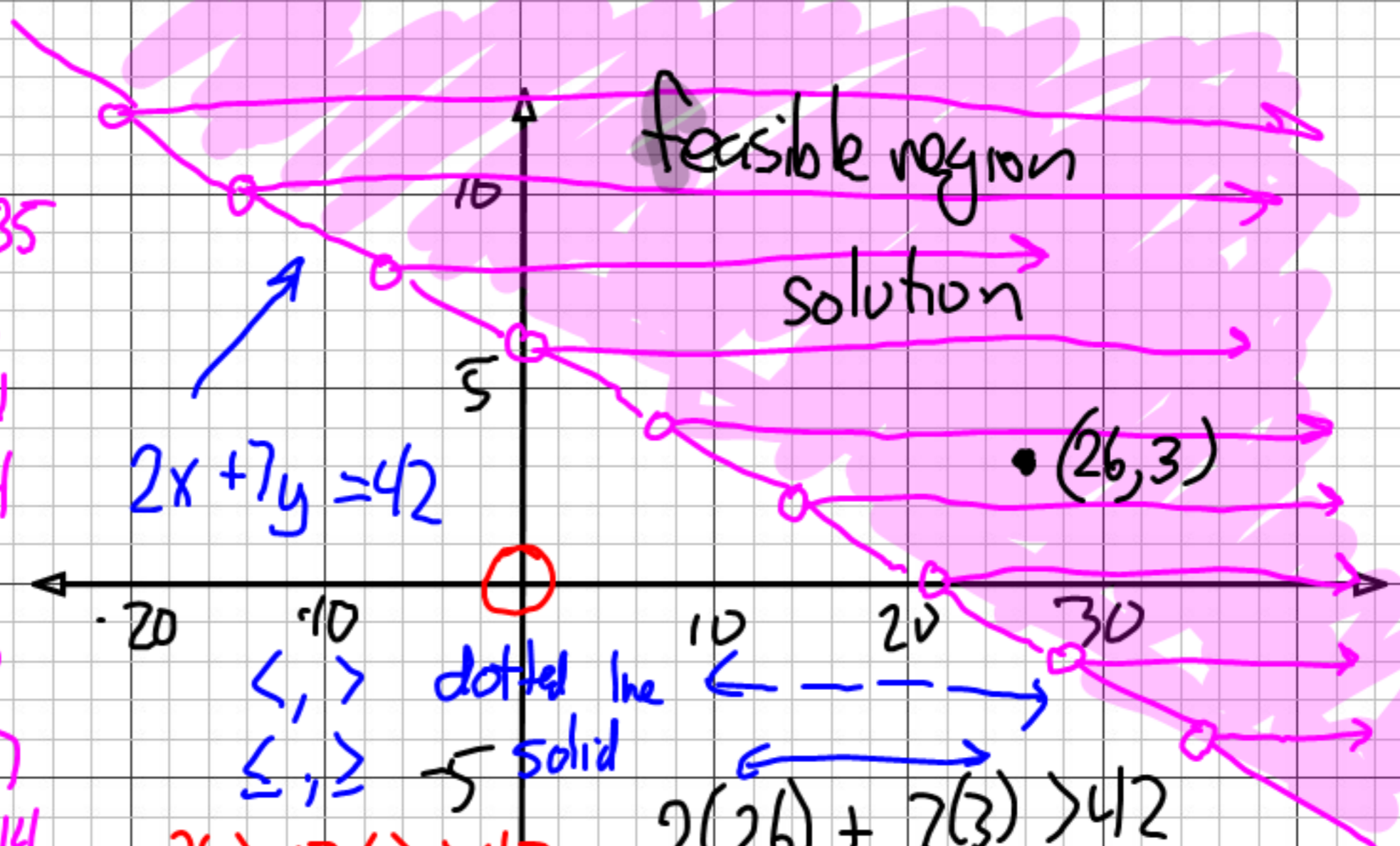
$$y = 4 \quad x > 7$$

$$y = 6 \quad x > 0$$

$$y = 8 \quad x > -7$$

$$y = 10 \quad x > -14$$

$$y = 12 \quad x > -21$$



$$2x + 7y = 42$$

• (26, 3)

$<, >$ dotted line
 \leq, \geq solid

$$2(0) + 7(0) > 42$$

$$0 > 42$$

not in
feasible region
(wrong side of the fence)

$$2(26) + 7(3) > 42$$

$$52 + 21 > 42$$

$$73 > 42$$