

$x =$  cheese cake

$y =$  brookies

Restrictions

$$x + y \leq 8$$

$$5x + 2y \leq 20$$

$$x \geq 0$$

$$y \geq 0$$

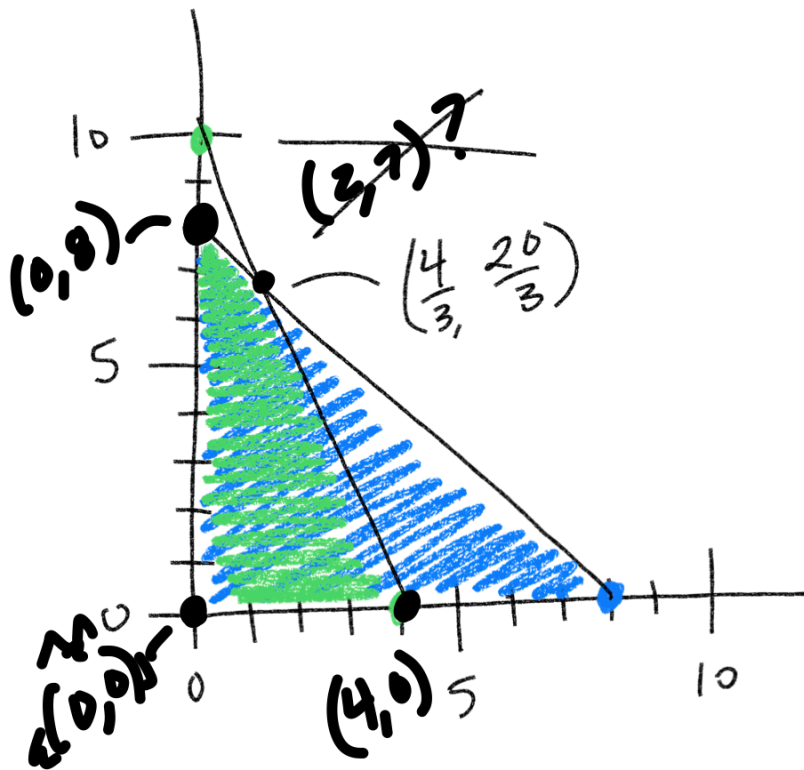
Quad I

$$\begin{aligned} -2(x + y = 8) \\ 5x + 2y = 20 \end{aligned}$$

$$\begin{aligned} -2x - 2y &= -16 \\ + 5x + 2y &= 20 \end{aligned}$$

$$\frac{3x}{3} = \frac{4}{3} \quad x = \frac{4}{3}$$

$$y = \frac{20}{3}$$



$$x + y = 8$$

$$\begin{aligned} \frac{4}{3} + y &= 8 && (0, 8) \\ -\frac{4}{3} & \quad -\frac{4}{3} && (4, 0) \\ y &= 8 - \frac{4}{3} && (\frac{4}{3}, \frac{20}{3}) \\ \frac{24}{3} - \frac{4}{3} &= \frac{20}{3} && \end{aligned}$$

$$P = 8x + 4y$$

$$(0, 0) = 8(0) + 4(0) = \$0$$

$$(0, 8) = 8(0) + 4(8) = \$32$$

$$(1, 6) = 8(1) + 4(6) = 8 + 24 = \$32$$

$$P = 8x + 4y$$

$$(4, 0) = 8(4) + 4(0) = \$32$$

$$\left(\frac{4}{3}, \frac{20}{3}\right) = 8\left(\frac{4}{3}\right) + 4\left(\frac{20}{3}\right) = \frac{32}{3} + \frac{80}{3} = 10.66 + 26.66 = \$37.32$$

$$\begin{aligned} (1) & -4x - 3y + 3z = 8 \\ (2) & -x + y + 2z = 0 \\ (3) & -2x + 4y - z = 17 \end{aligned}$$

$$\begin{aligned} (2) & -x + y + 2z = 0 \\ (3) & -2x + 4y - z = 17 \end{aligned}$$

$$\begin{aligned} (2^*) & 2x - 2y - 4z = 0 \\ + (3) & -2x + 4y - z = 17 \\ \hline (5) & 2y - 5z = 17 \end{aligned}$$

$$y=1$$

$$\begin{aligned} (5) & 2y - 5z = 17 \\ 2(1) - 5z & = 17 \\ 2 - 5z & = 17 \\ -2 & \quad -2 \\ \hline -5z & = 15 \\ \frac{-5z}{-5} & = \frac{15}{-5} \\ \boxed{z} & = \boxed{-3} \end{aligned}$$

$$(x, y, z)$$

$$(-5, 1, -3)$$

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

$$\begin{aligned} (1) & -4x - 3y + 3z = 8 \\ (2) & -x + y + 2z = 0 \end{aligned}$$

$$\begin{aligned} (1) & -4x - 3y + 3z = 8 \\ + (2^*) & 4x - 4y - 8z = 0 \\ \hline (4) & -7y - 5z = 8 \end{aligned}$$

$$\begin{aligned} (4)^{-1} & (-7y - 5z = 8) \\ (5) & 2y - 5z = 17 \end{aligned}$$

$$(4^*) \quad 7y + 5z = -8$$

$$\begin{aligned} + (5) & 2y - 5z = 17 \\ \hline 9y & = 9 \\ \frac{9y}{9} & = \frac{9}{9} \end{aligned}$$

$$\boxed{y = 1}$$

$$(2) \quad -x + y + 2z = 0$$

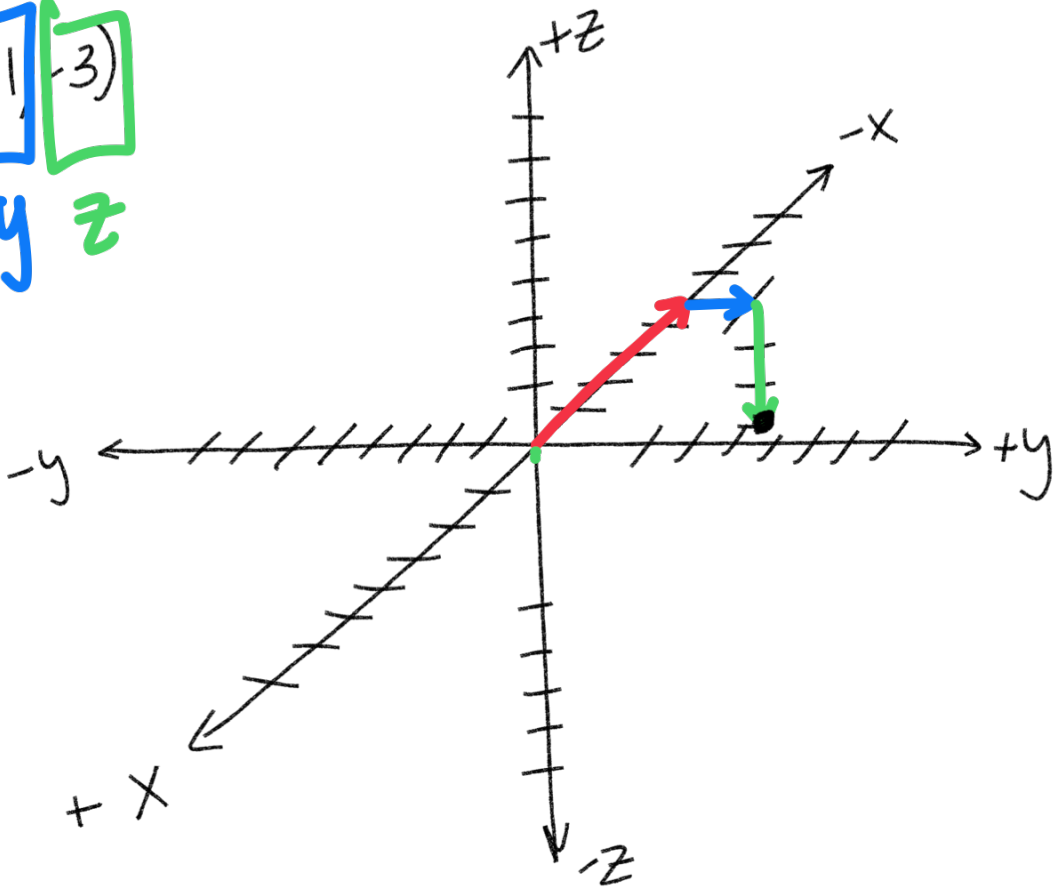
$$-x + 1 + 2(-3) = 0$$

$$-x + 1 - 6 = 0$$

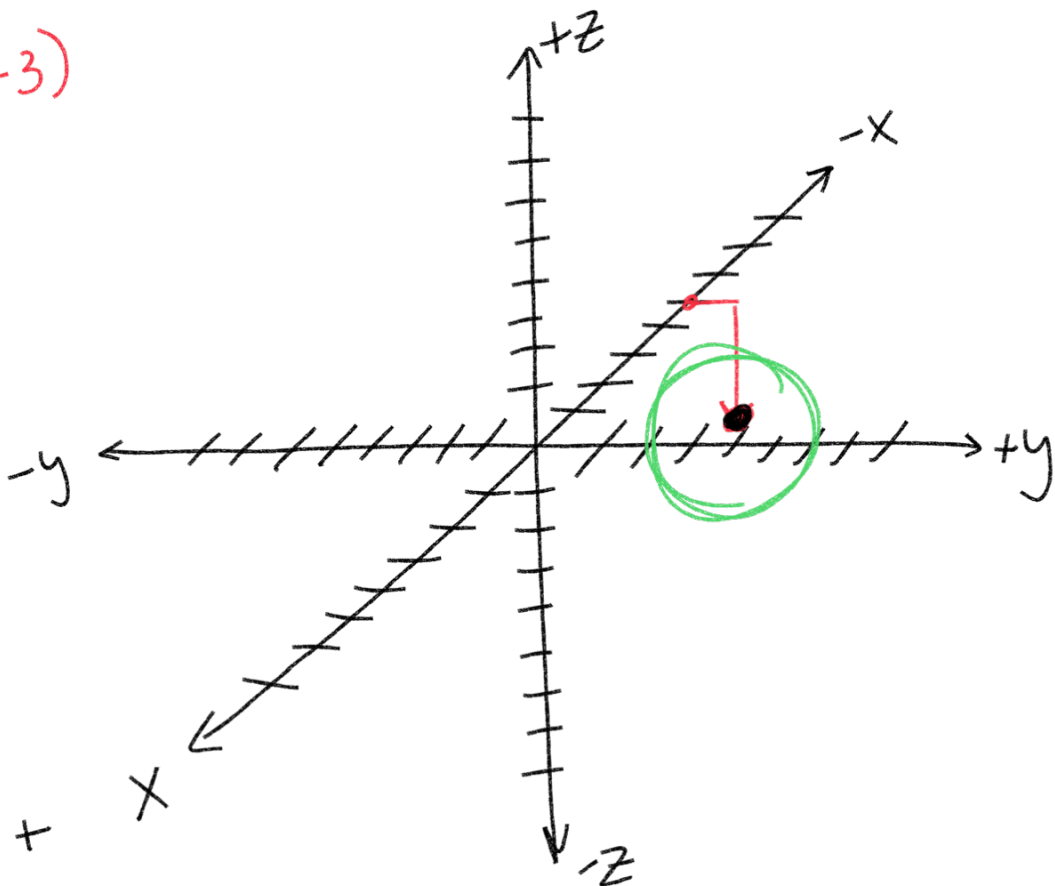
$$-x - 5 = 0$$

$$\begin{aligned} +5 & +5 \\ -x & = 5 \\ \frac{-x}{-1} & = \frac{5}{-1} \end{aligned}$$

$(-5, 1, -3)$   
x y z



$(-5, 1, -3)$



$$\begin{aligned} (1) \quad & x + 4y - 5z = 13 \\ (2) \quad & -4x + 2y + 2z = -16 \\ (3) \quad & 3x - y - 4z = 21 \end{aligned}$$

$$\begin{aligned} (1) \quad & x + 4y - 5z = 13 \\ (3) \quad & 3x - y - 4z = 21 \end{aligned}$$

$$\begin{aligned} & -3x - 12y + 15z = -39 \\ + & 3x - y - 4z = 21 \\ \hline (5) \quad & -13y + 11z = -18 \end{aligned}$$

Find y

$$\begin{aligned} (4) \quad & y - z = 2 \\ & y - (-4) = 2 \\ & y + 4 = 2 \\ & -4 - 4 \\ & \boxed{y = -2} \end{aligned}$$

$(x, y, z)$   
 $(1, -2, -4)$  12.5 pts

$$\begin{aligned} x + 4y - 5z &= 13 \\ x + 4(-2) - 5(-4) &= 13 \\ x - 8 + 20 &= 13 \\ x + 12 &= 13 \\ -12 \quad -12 & \\ \hline & \boxed{x = 1} \end{aligned}$$

$$(1) \quad x + 4y - 5z = 13$$

$$(2) \quad -4x + 2y + 2z = -16$$

$$\begin{aligned} & 4x + 16y - 20z = 52 \\ + & -4x + 2y + 2z = -16 \\ \hline \end{aligned}$$

$$\frac{18y - 18z = 36}{18 \quad 18 \quad 18}$$

$$(4) \quad y - z = 2$$

$$(4) \quad y - z = 2$$

$$(5) \quad -13y + 11z = -18$$

$$\begin{aligned} & 13y - 13z = 26 \\ - & 13y + 11z = -18 \\ \hline & -2z = 8 \\ & \frac{-2z}{-2} = \frac{8}{-2} \\ & \boxed{z = -4} \end{aligned}$$

$(1, -2, -4)$   
↑    ↑    ↑  
x    y    z

