T-A2 Algebra 2 Week 19 1/30

<u>Restrictions</u>

x = popsicles y = lolmets

$x + y \le 8$

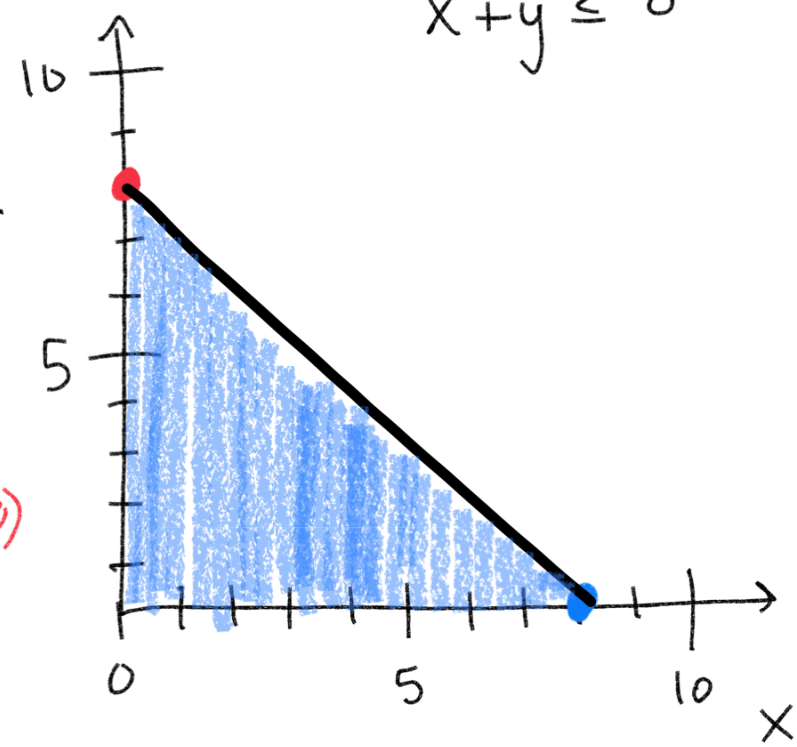
$\$2x + \$8y \le 24$

$x \ge 0$, $y \ge 0$ } Keeps everything in Quad I

$P = \$6x + \$10y$

1.) Graph each

$x + y \le 8$



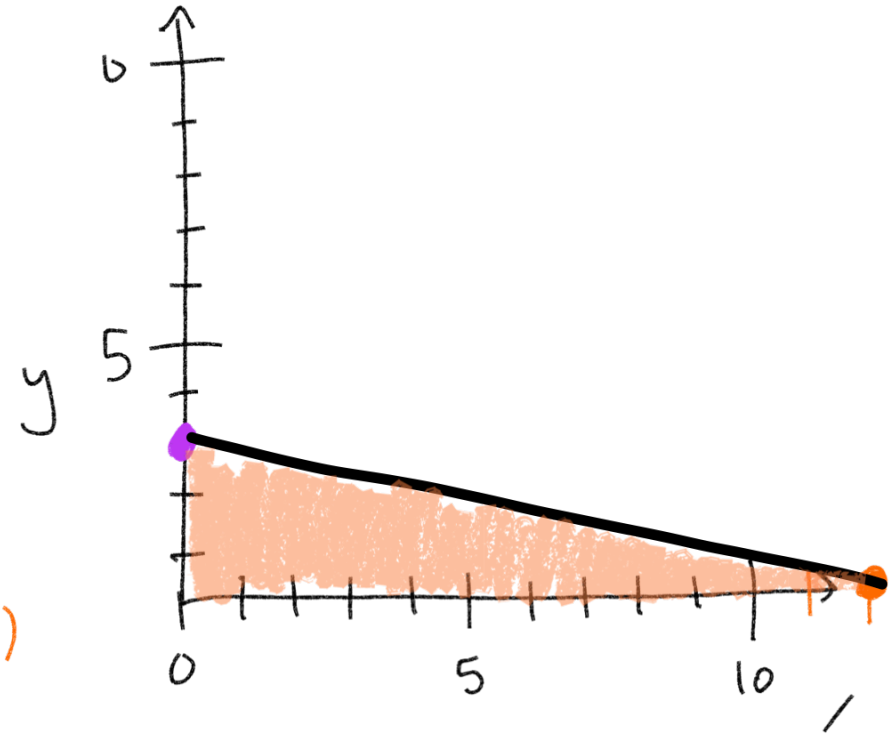
$\cancel{x} + y = 8$

$x = 0$ $y = 8$ $(0,8)$

$x + \cancel{y} = 8$

$x = 8$ $y = 0$ $(8,0)$

$2x + 8y \le 24$



$\cancel{2x} + 8y = 24$

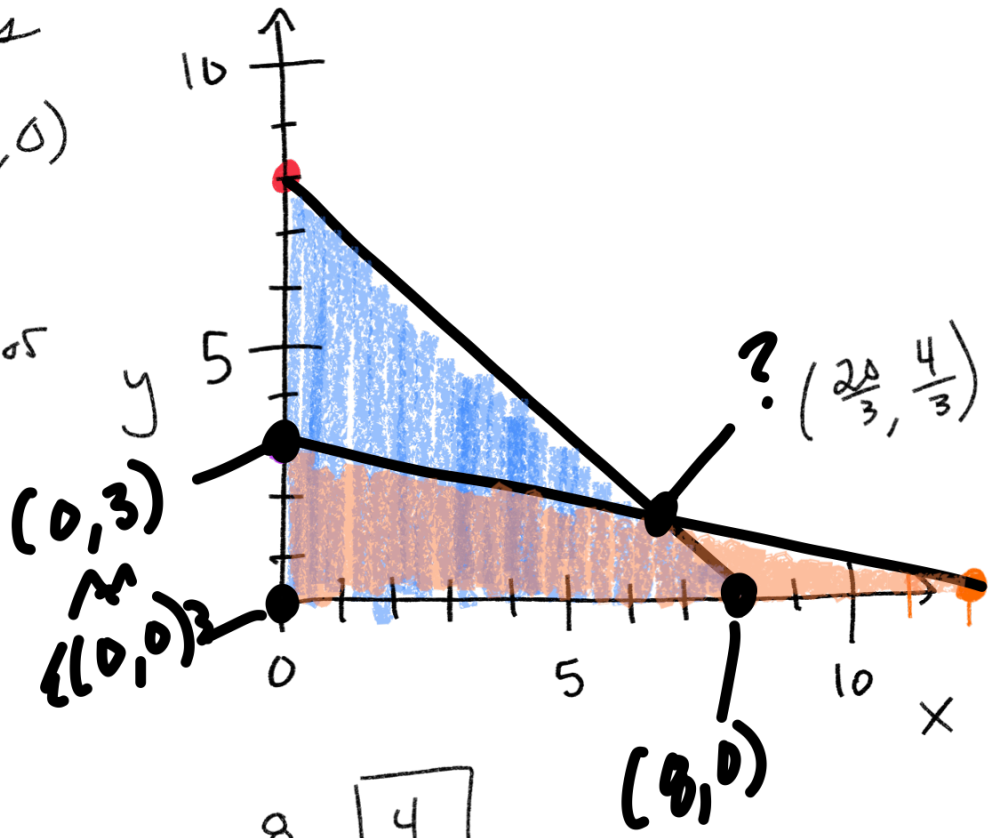
$x = 0$ $y = 3$ $(0,3)$

$2x + \cancel{8y} = 24$

$x = 12$ $y = 0$ $(12,0)$

2.) Find Vertices

$\{(0,0)\}$, $(0,3)$, $(8,0)$



Floater

(Use substitution or elimination)

$-2(x + y = 8)$

$2x + 8y = 24$

$$\begin{array}{r} -2x - 2y = -16 \\ + \quad 2x + 8y = 24 \\ \hline 6y = 8 \end{array}$$

$$\frac{6y}{6} = \frac{8}{6}$$

$y = \frac{8}{6} = \boxed{\frac{4}{3}}$

$x + y = 8$

$x + \frac{4}{3} = \frac{24}{3} - \frac{4}{3}$

$-\frac{4}{3}$

$\boxed{x = \frac{20}{3}}$

Floating: $(\frac{20}{3}, \frac{4}{3})$

3.) Plug into Profit Equation

$\$6x + \$10y = P$

$\{(0,0)\}$ $(0,3)$ $(8,0)$ $(\frac{20}{3}, \frac{4}{3})$

$(0,0)$: $\$6(0) + \$10(0) = \$0$

$(0,3)$: $\$6(0) + \$10(3) = \$30$

$(8,0)$: $\$6(8) + \$10(0) = \$48$

$\boxed{(\frac{20}{3}, \frac{4}{3})}$ $\$6(\frac{20}{3}) + \$10(\frac{4}{3}) = \$40 + \$13.33 = \boxed{\$53.33}$

Restrictions

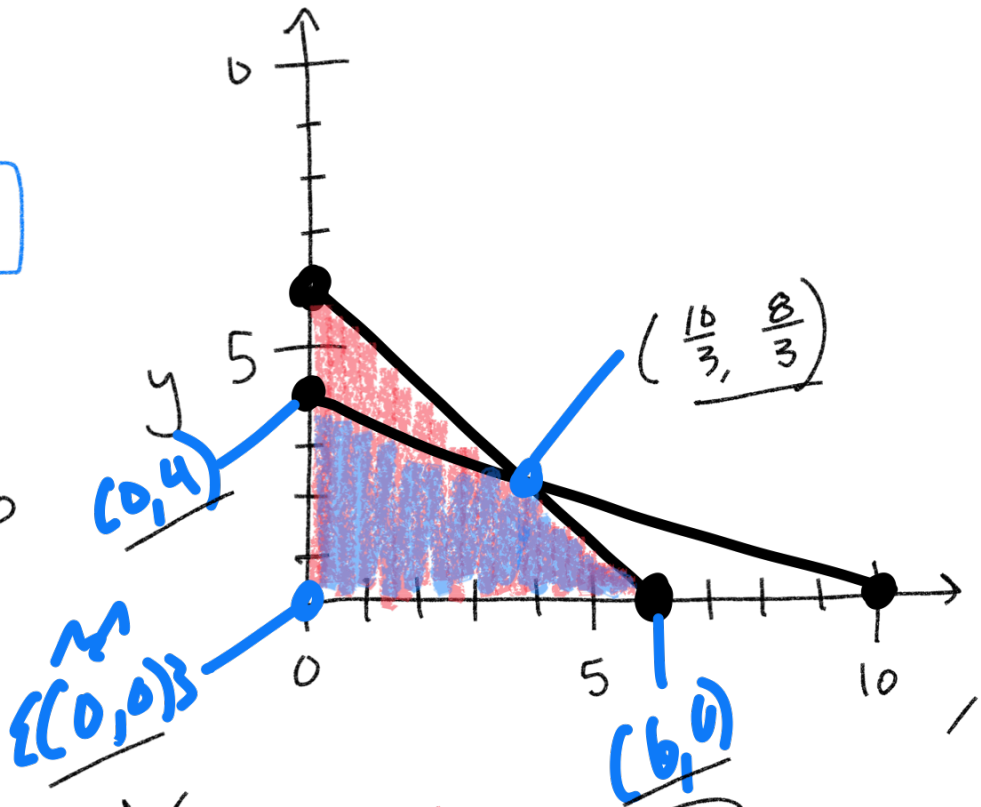
$$\boxed{x + y \le 6}$$

$$\boxed{4x + 10y \le 40}$$

$$x \ge 0$$

$$y \ge 0$$

$$\$5x + \$8y = P$$



$$-4(x + y = 6)$$
$$4x + 10y = 40$$

$$\cancel{-4x} - 4y = -24$$
$$+\ \cancel{4x} + 10y = 40$$
$$\frac{6y}{6} = \frac{16}{6}$$
$$y = \frac{8}{3}$$

$$x + y = 6$$
$$x + \frac{8}{3} = \frac{18}{3}$$
$$-\frac{8}{3} \qquad -\frac{8}{3}$$
$$x = \frac{10}{3}$$

$$\$5x + \$8y = P$$

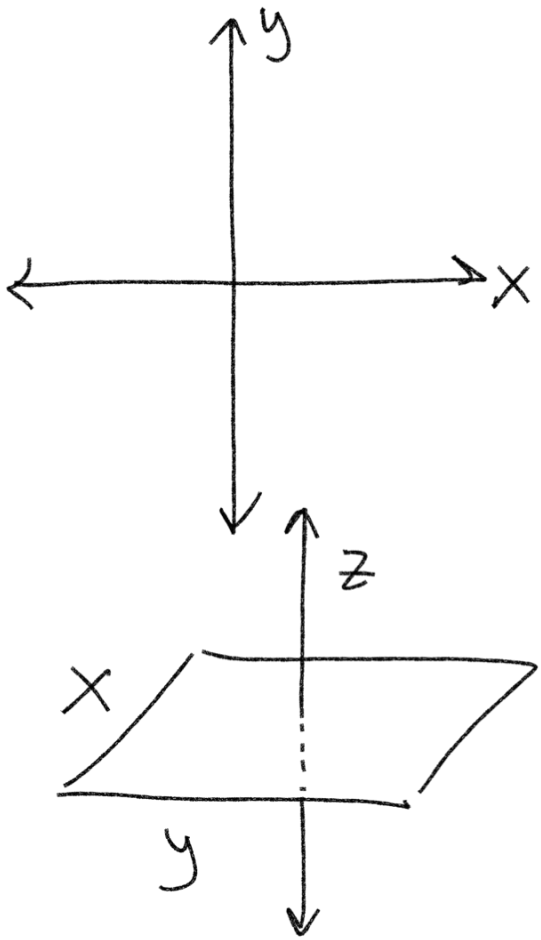
$(0,0)$: $5(0) + 8(0) = \$0$

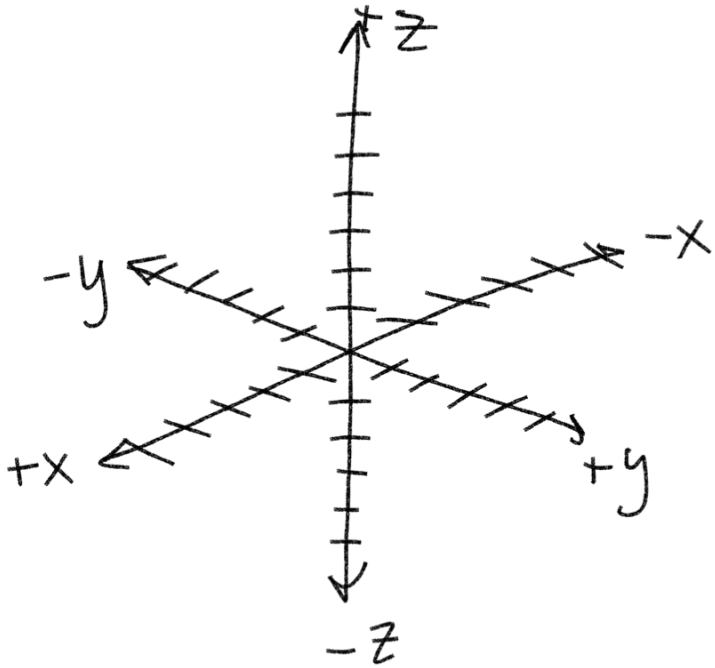
$(0,4)$: $5(0) + 8(4) = \$32$

$(6,0)$ $5(6) + 8(0) = \$30$

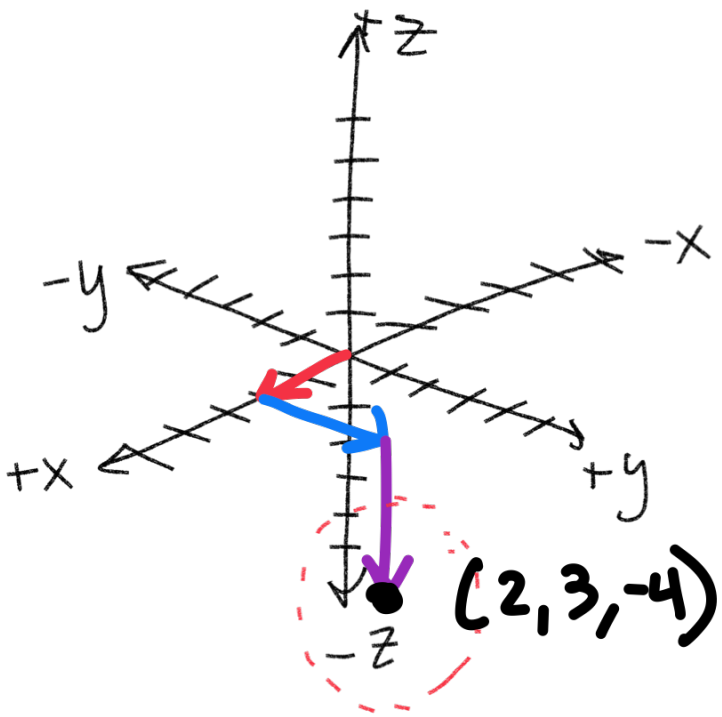
$\boxed{\left(\frac{10}{3}, \frac{8}{3}\right)}$ $5\left(\frac{10}{3}\right) + 8\left(\frac{8}{3}\right) = \frac{50}{3} + \frac{64}{3} = \$16.6\overline{6} + \$21.3\overline{3}$

$$\boxed{\$38}$$





$$\begin{pmatrix} 2 & 3 & -4 \\ x & y & z \end{pmatrix}$$



1) $-4x - 3y + 3z = 8$

2) $-x + y + 2z = 0$

3) $-2x + 4y - z = 17$

1.) Eliminate x <u>twice</u>

2.) Eliminate z

1) $-4x - 3y + 3z = 8$

2) $-4(-x + y + 2z = 0)$

$$\begin{array}{r} -\cancel{4x} - 3y + 3z = 8 \\ + \quad \cancel{4x} - 4y - 8z = 0 \\ \hline 4 \quad -7y - 5z = 8 \end{array}$$

4) $-7y - 5z = 8$

4) $-1(-7y - 5z = 8)$

5) $2y - 5z = 17$

$$\begin{array}{r} 7y + \cancel{5z} = -8 \\ + \; 2y - \cancel{5z} = 17 \\ \hline \frac{9y}{9} = \frac{9}{9} \end{array}$$

(x, y, z)

$(-5, 1, -3)$

Bottom of Rabbit Hole $\boxed{y = 1}$

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

3) $-2x + 4y - z = 17$

$$\begin{array}{r} \cancel{2x} - 2y - 4z = 0 \\ + \; \cancel{-2x} + 4y - z = 17 \\ \hline 5 \quad 2y - 5z = 17 \end{array}$$

1 2 3

$-x + y + 2z = 0$

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

$-x + 1 - 6 = 0$

$-x - 5 = 0$

$+5 \quad +5$

$\frac{-x}{-1} = \frac{5}{-1}$ $\boxed{x = -5}$

$2y - 5z = 17$

4 or 5 $2(1) - 5z = 17$

$2 - 5z = 17$

$-2 \quad -2$

$\frac{-5z}{-5} = \frac{15}{-5}$

$\boxed{z = -3}$

$$\begin{array}{ccc} x & y & z \\ (-5, & 1, & -3) \end{array}$$