

Unit 1 Review Material

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- 5) Your factory makes fruit filled breakfast bars and granola bars. For each case of breakfast bars, you make a \$40 profit. For each case of granola bars, you make a \$55 profit. It takes 2 machine hours to make a case of breakfast bars and 4 hours of labor. It takes 4 machine hours and 2 labor hours to make a case of granola bars. You have a maximum of 160 machine hours and 110 labor hours available. How many cases of each product should you produce in order to maximize profit?

a) Define your variables and label the graph.

x: # of breakfast bar cases
y: # of granola bar cases

b) Write the constraints.

$$4x + 2y \leq 110$$

$$2x + 4y \leq 160$$

c) Write the objective function.

PROFIT

$$P = \$40x + \$55y$$

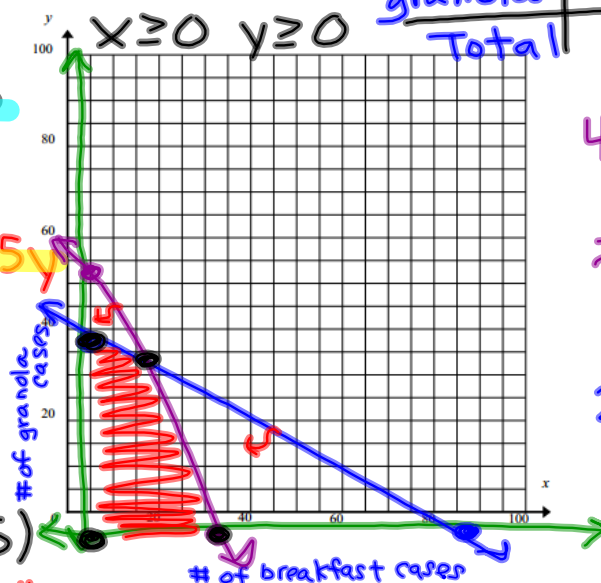
d) Graph the constraints.

e) Name the vertices.

(0,0), (27.5,0)

(0,40), (10,35)

What is the maximum profit?



	Labor Hrs	Machine Hrs	Profit
breakfast	4	2	\$40
granola	2	4	\$55
Total	110	160	

$$4x + 2y \leq 110$$

$$\begin{array}{r|l} x & y \\ \hline 27.5 & 0 \\ 0 & 55 \end{array}$$

$$2x + 4y \leq 160$$

$$\begin{array}{r|l} x & y \\ \hline 80 & 0 \\ 0 & 40 \end{array}$$

(x,y)	P = \$40x + \$55y	Value
(0,0)	40(0) + 55(0) =	0 = P
(27.5,0)	40(27.5) + 55(0) =	1,100 = P
(0,40)	40(0) + 55(40) =	2,200 = P
(10,35)	40(10) + 55(35) =	2,325 = P*

g) How many cases of each product should you produce to maximize profit?

\$2,325

10 cases of breakfast bars
35 cases of granola bars