

Key

Constraints in Decision Making – Beth's Bags

Beth is at a store having a sale on purses. The big purses are going for \$20 each, and the small purses are going for \$10 each. She has \$80 to spend.

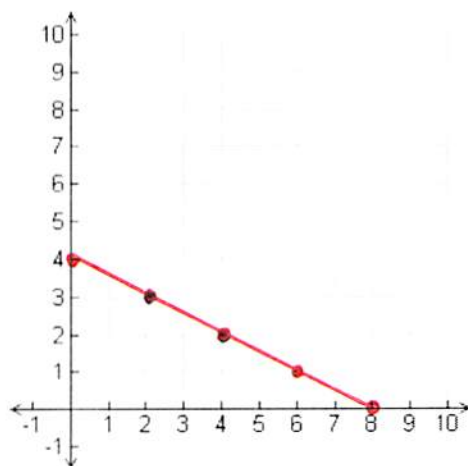
- 1) Write an equation using 2 variables to represent Beth's purchasing decision. Define your variables. b = number of big purses s = number of small purses

$$20b + 10s = 80$$

- 2) Solve your equation in terms of the number of big purses, b .

$$b = \frac{80 - 10s}{20} \quad b = -\frac{1}{2}s + 4$$

- 3) Graph the equation you just came up with in problem #2.



- 4) How many big purses can she get if she buys 3 small purses?

$$b = -\frac{1}{2}(3) + 4 = -1.5 + 4 = 2.5$$

2 big purses

- 5) How many small purses can she buy if she buys 2 big purses?

$$\begin{array}{r} 20(2) + 10s = 80 \\ 40 + 10s = 80 \\ -40 \quad -40 \\ \hline 10s = 40 \\ \frac{10s}{10} = \frac{40}{10} \\ s = 4 \end{array} \quad \begin{array}{l} 4 \text{ small} \\ \text{purses} \end{array}$$

- 6) Is it possible for her to buy 3 of each kind of purse?

$$\begin{array}{r} 20(3) + 10(3) \leq 80 \\ 60 + 30 \leq 80 \\ 90 \not\leq 80 \end{array} \quad \begin{array}{l} \text{No } \$90 \text{ is} \\ \text{too much.} \end{array}$$