

Working the System

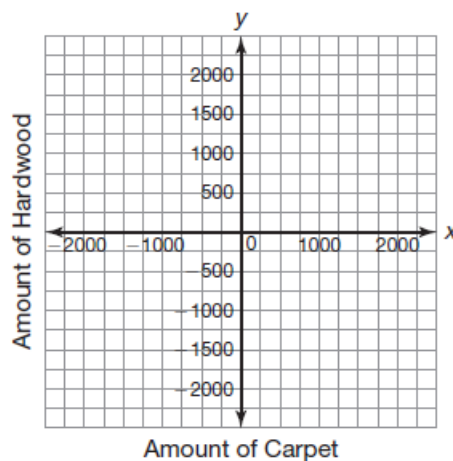
Systems of Linear Inequalities

1. Samuel is remodeling his basement. One part of the planning involves the flooring. He knows that he would like both carpet and hardwood, but isn't sure how much of each he will use. The most amount of flooring area he can cover is 2000 square feet. The carpet is \$4.50 per square foot and the hardwood is \$8.25 per square foot. Both prices include labor costs. Samuel has budgeted \$10,000 for the flooring.

a. Write a system of inequalities to represent the maximum amount of flooring needed and the maximum amount of money Samuel wants to spend.

b. One idea Samuel has is to make two rooms; one having 400 square feet of carpeting and the other having 1200 square feet of hardwood. Determine whether this amount of carpeting and hardwood are solutions to the system of inequalities. Explain your reasoning in terms of the problem situation.

c. Graph this system of inequalities.



d. Determine the intersection point of the two lines. Is this a solution to this system of inequalities in terms of the problem situation?

e. Identify two different solutions to the system of inequalities. Explain what the solutions represent in terms of the problem situation.

f. Determine one combination of amounts of carpet and hardwood that is *not* a solution for the system of inequalities. Explain your reasoning.

Graph the system of inequalities

$$\begin{cases} y \leq -\frac{2}{3}x + 3 \\ y \geq 3x - 4 \end{cases}$$

