

1. As part of its planning process, the Sam Manufacturing Company must determine the mix of its products to be manufactured next year. The company produces two principal product lines for the commercial construction industry, a line of circular saws and a line of table saws. These two lines share the same production capacity and are sold through the same supply chain. The average profit for each circular saw is \$900 and the average profit for each table saw is \$600. There is a maximum of 4,000 hours of fabrication capacity available per month and a maximum of 5,000 hours of assembly capacity available per month. Each circular saw requires 2 hours of fabrication and 1 hour of assembly and each table saw requires 1 hour of fabrication and 2 hours of assembly. The marketing department estimates that the maximum demand for both product lines will be 3,500 per month next year. Formulate this LP problem and solve it graphically to determine the number of each line of saw Strayer should produce per month next year.

2. The Douglasville foundry is developing a planning to buy scrap metal for its operations. The foundry can buy scrap metal in unlimited quantities from two sources, Atlanta (A) and Birmingham (B). The foundry receives scrap in railroad cars every day. The scrap is melted down, and lead and copper are extracted for use in the foundry processes. Each railroad car of scrap from Atlanta yields 1 ton of copper and 1 ton of lead and costs \$10,000. Each railroad car of scrap from Birmingham yields 1 ton of copper and 2 tons of lead and costs \$15,000. If the foundry needs at least 2.5 tons of copper and at least 4 tons of lead per day for the foreseeable future, how many railroad cars of scrap should be purchased per day from Atlanta and Birmingham? You may use either the graphical method of LP or the solver in Excel to answer this question, but if you use the latter, be sure to show your work.

3. Ruby's Fertilizer company ships fertilizer from two plants to three customers. The shipping cost per ton of fertilizer from each plant to each customer is:

Plant	Customer		
	A	B	C
1	\$15	\$30	\$20
2	20	25	15

Plant 1 has a monthly capacity of 1,000 tons and Plant 2 has a monthly capacity of 2,000 tons. The monthly customer demand is: A=500 tons, B=1,500 tons, and C=1,000 tons. Formulate an LP problem to determine how much fertilizer should be shipped from each plant to each customer per month. Use solver to make a decision. Show your work.