MATH 364 – Thursday, September 6, 2018

This in-class activity will be completed as homework. A type-written report *(not hand-written)* of your solution is due Tuesday, September 11, in class.

A furniture company is deciding how to use some left over materials at the end of a production cycle. The company has 48 board-feet of lumber in the warehouse, 8 hours of rough carpentry employee time and 20 hours of finishing carpentry employee time available. The factory is tooled to make any combination of tables, desks and chairs. Each desk requires 8 board feet of lumber, 2 rough carpentry hours and 4 finishing carpentry hours. Each table requires 6 board feet of lumber, 1.5 rough carpentry hours and 2 finishing carpentry hours. Each chair requires 1 board feet of lumber, 0.5 rough carpentry hours and 1.5 finishing carpentry hours. Desks, tables and chairs provide \$60, \$30 and \$20 profit each, respectively.

The company CEO has asked you for a report providing a plan for the use of the company's excess materials and employee hours. Write a formal report with (at least) the following elements.

1. Title information.
2. Executive Summary. This is a one paragraph description of your proposal describing manufaturing plan, profit information, use of resources. Include any items that might be of interest to the CEO or other coordinators in the company.
3. Problem Description. Write a description of the problem and describe your approach to a solution.
4. Optimization Model. Provide (with justification) an optimization model (a linear or integer program) that will address the problem.
5. Solution. Report the solution and how it was obtained.