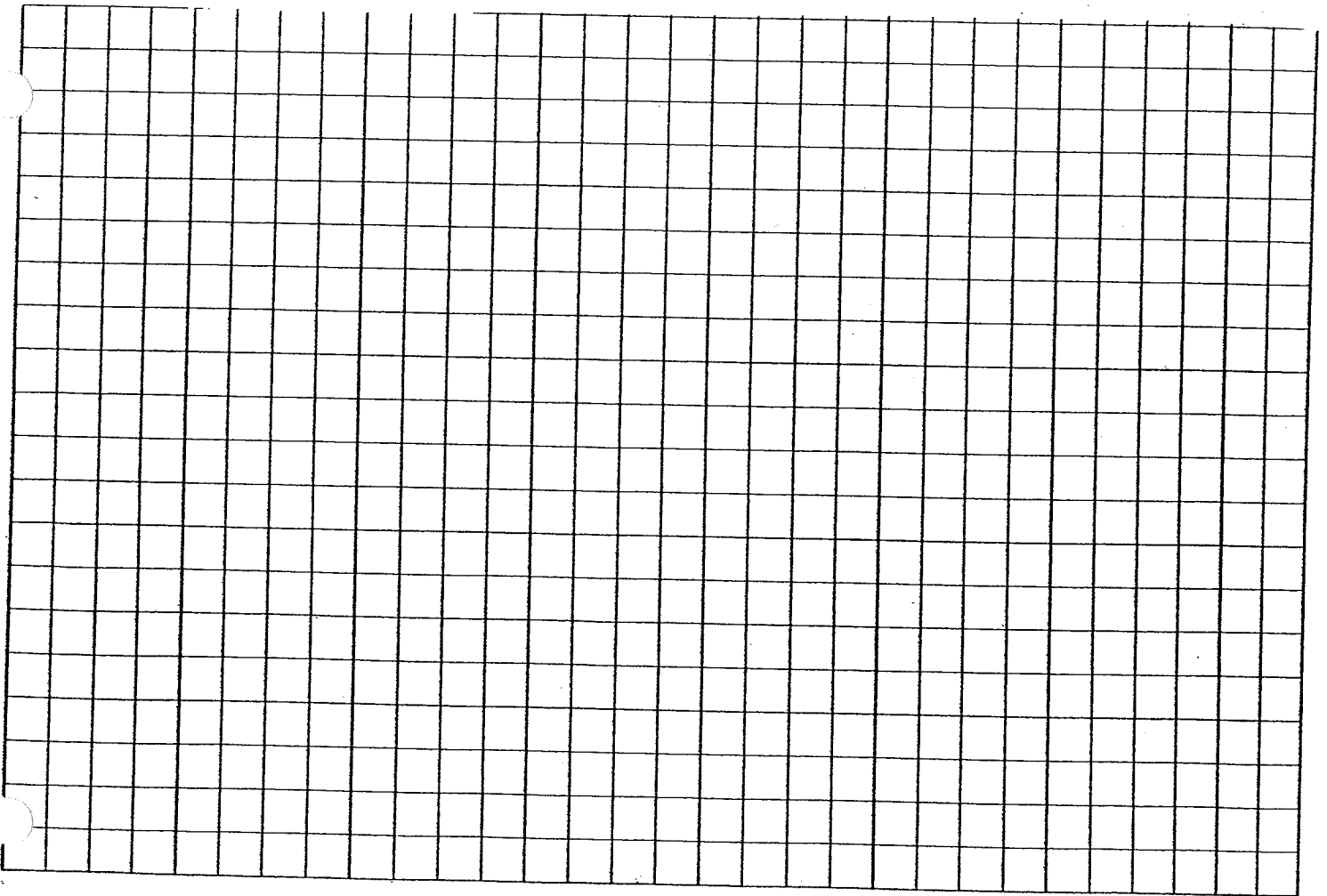


# MATH ANALYSIS I

## LINEAR PROGRAMMING

A factory produces short-sleeved and long-sleeved shirts. A short-sleeved shirt requires 30 minutes of labor, and a long-sleeved shirt requires 45 minutes of labor. There are 240 hours of labor available per day. The maximum number of shirts that can be packaged in a day is 400, so no more than 400 shirts should be produced each day. The profit on a short-sleeved shirt is \$11, while the profit on a long-sleeved shirt is \$16.

- a) What output of short-sleeved and long-sleeved shirts will produce the maximum daily profit?
- b) If the profit on long-sleeved shirts goes up to \$20, what output combination would produce the most profit?



## How to Approach a Linear Programming Problem

A contractor builds two types of homes. The Carolina requires one lot, \$160,000 capital, and 160 worker-days of labor, whereas the Savannah requires one lot, \$240,000 capital, and 160 worker-days of labor. The contractor owns 300 lots and has \$48,000,000 available capital and 43,200 worker-days labor. The profit on the Carolina is \$40,000 and the profit on the Savannah is \$50,000. List the corner points of the feasible region and find how many of each type of home should be built to maximize profit.

Find the maximum profit.