MA 110 WORKSHEET (5.3)

NAME _____

A city council voted to conduct a study on inner-city community problems. A nearby university was contracted to provide sociologists and research assistants. Each Sociologist can provide 10 hours of fieldwork and 30 hours in the Research Center, and costs $500 per week to hire. Each Research Assistant can provide 30 hours of Fieldwork and 10 hours in the Research Center, and costs $300 per week to hire. The weekly labor-hour requirements are at least 180 hours of Fieldwork and 140 hours of Research Center assistance. How many sociologists and how many research assistants should be hired to meet the weekly labor-hour requirements while minimizing the weekly cost? What is the minimum weekly cost?

ORGANIZATION: Finish filling in the table using the information given.

	Sociologist Labor-hours	Research Assistant Labor-hours	Minimum Labor-Hours needed per week
Fieldwork			
Research Center			
COST PER WEEK			

SET UP THE MATH MODEL:

Let x = _____   Let y = _____

Write ALL the constraints implied by the table. Do not forget the nonnegative constraints.

Write the objective function and tell in sentence form whether the objective is to be minimized or maximized.

GRAPH OF FEASIBLE REGION:

FIND THE CORNER POINTS:

FIND THE SOLUTION:
Use the corner points to determine the optimal solution(s).

CORNER POINTS	X	Y	COST
A			
B			
C			

Write the optimal solution in sentence form.

INVESTIGATION:
How many labor-hours are used each week in fieldwork?

How many labor-hours are used each week in research?