

M123 TEST 4 REVIEW OUTLINE

HAVE QUESTIONS READY FOR ME ON OUR REVIEW DAY! PRINT THIS AND KEEP IT FOR THE FINAL EXAM REVIEW AT THE END OF THE TERM.

PART III: LINEAR PROGRAMMING

1. LESSON 3.1: SOLVING LINEAR PROGRAMMING PROBLEMS GRAPHICALLY

- BOUNDED PROBLEMS – MAKE A SKETCH (*LABEL AXES & NUMBER CONSTRAINTS*), LABEL FEASIBLE REGION, LIST VERTICES, FIND THE MAXIMUM OR MINIMUM VALUES (*CORRESPONDING TO EACH VERTEX*), STATE THE SOLUTION.
- UNBOUNDED PROBLEMS – SAME STEPS AS FOR BOUNDED PROBLEMS PLUS CHECK FOR IMPROVEMENT IN THE UNBOUNDED DIRECTION, i.e. DO A TEST POINT.
- APPLICATIONS: STATE CLEARLY THE MEANING OF YOUR VARIABLES, SET UP THE LINEAR PROGRAMMING PROBLEM, SOLVE THE LP PROBLEM USING A SKETCH (*SEE DETAILS ABOVE*).

2. LESSON 3.2 – THE (ONE-STAGE) SIMPLEX METHOD

- STANDARD SIMPLEX: MUST BE A MAX PROBLEM AND THE CONSTRAINTS MUST BE IN THE FORM \leq .
- RULES:
 - a. SET UP THE INITIAL SIMPLEX TABLEAU;
 - b. BOX THE NEGATIVE INDICATOR (*MOST NEGATIVE NUMBER IN THE BOTTOM ROW*);
 - c. CIRCLE THE PIVOT ELEMENT (*ABOVE THE NEGATIVE INDICATOR, CONSIDER ONLY POSITIVE NUMBERS, CHOOSE SMALLEST RATIO*);
 - d. RUN THE PIVOT PROGRAM;
 - e. REPEAT STEPS b) THRU d) AS NECESSARY;
 - f. INTERPRET THE FINAL TABLEAU.

3. LESSON 3.3 – THE TWO-STAGE SIMPLEX METHOD

- GENERAL SIMPLEX: MUST BE A MAX PROBLEM AND THE CONSTRAINTS MUST BE CHANGED TO THE FORM \leq .
- RULES:
 - a. SET UP THE INITIAL SIMPLEX TABLEAU.
 - b. BOX THE NEGATIVE INDICATOR (*MOST NEGATIVE NUMBER IN THE Far RIGHT COLUMN*).
 - c. CIRCLE THE PIVOT ELEMENT (*LEFT OF THE NEGATIVE INDICATOR, CONSIDER ONLY NEGATIVE NUMBERS, CHOOSE LARGEST RATIO*).
 - d. RUN THE PIVOT PROGRAM. REPEAT STEPS b) thru d) AS NECESSARY.
 - e. INTERPRET THE FINAL TABLEAU.

4. LESSON 3.4 – THE DUAL METHOD

- STANDARD DUAL: MUST BE A MIN PROBLEM AND THE CONSTRAINTS MUST BE IN THE FORM \geq
- RULES:
 - a. CONVERT THE MIN PROBLEM TO A MAX PROBLEM (*“DUAL MAX PROBLEM”*);
 - b. USE THE SIMPLEX METHOD;
 - c. INTERPRET THE FINAL TABLEAU.