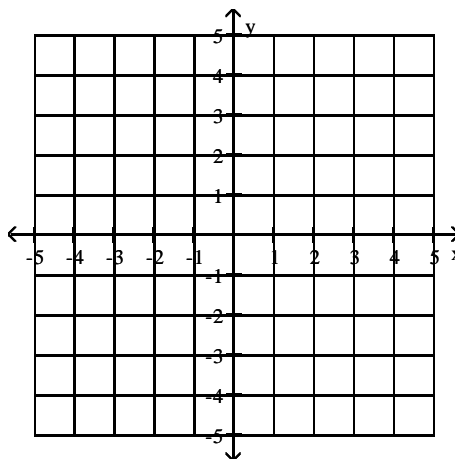


- 1) Solve graphically: $x + 2y = 4$
 $2x + y = -1$



- 2) Solve by augmented matrices: $4x - 2y + 6z = 1$ (You may use a calculator)
 $3x + 4y + 2z = 1$
 $2x - y + 3z = 2$

- 3) Solve by augmented matrix methods: $2x + 3y + 5z = 21$
 (You may use a calculator) $x - y - 5z = -2$
 $2x + y - z = 11$

- 4) Solve by augmented matrix methods :(You may use a calculator)

$$x_1 - 3x_2 - 3x_3 = 13$$

$$x_2 - 4x_3 = 5$$

$$x_1 + x_3 = -4$$

- 5) A grain company wants to lease a fleet of 20 railcars with a combined capacity of 108,000 cubic feet. Rail cars with three different carrying capacities are available: 3,000 cubic feet, 4,500 cubic feet, and 6,000 cubic feet.

a) How many of each type of car should they lease?

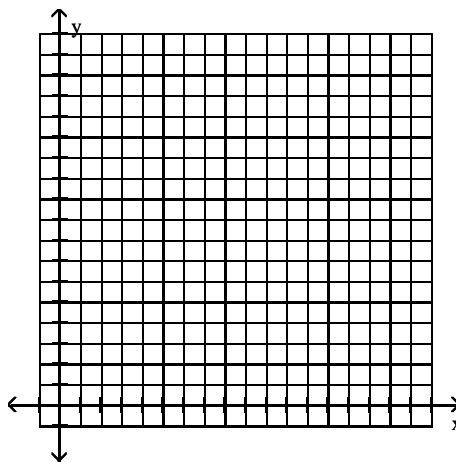
b) The monthly rates for leasing these cars are \$180 for 3,000 cubic feet, \$225 for 4,500 cubic feet, and \$325 for 6,000 cubic feet. Which of the solutions in part (a) would minimize the monthly leasing cost?

6) Find a, b, c, and d such that $\begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} 8 & -5 \\ 9 & -5 \end{bmatrix}$

7) Find x and y so that $\begin{bmatrix} 3x & 4 \\ 3 & x \end{bmatrix} + \begin{bmatrix} -y & 7 \\ -2 & 2y \end{bmatrix} = \begin{bmatrix} 2 & 11 \\ 1 & 10 \end{bmatrix}$

8) Solve graphically and find the coordinates of each corner point.

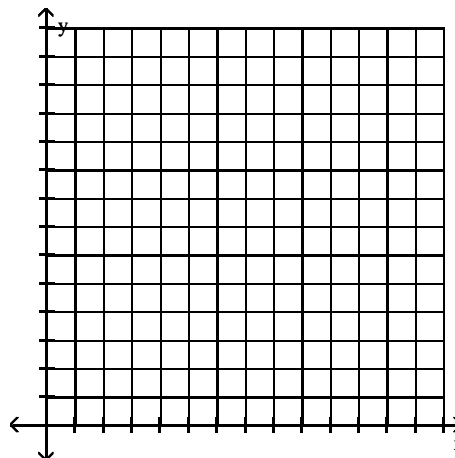
$$\begin{aligned} x + y &\leq 11 \\ x + 5y &\geq 15 \\ 2x + y &\geq 12 \end{aligned}$$



9) Solve the following linear programming problem by determining the feasible region on the graph below and testing the corner points:

Minimize $C = x + 6y$

Subject to $\begin{aligned} 3x + 4y &\geq 36 \\ 2x + y &\leq 14 \\ x, y &\geq 0 \end{aligned}$



Solve the problem.

- 10) A grain dealer sold to one customer 5 bushels of wheat, 2 of corn, and 3 of rye, for \$28.00; to another, 2 of wheat, 3 of corn, and 5 of rye, for \$31.70; and to a third, 3 of wheat, 5 of corn, and 2 of rye, for \$34.90. What was the price per bushel for corn?
- 11) A hospital dietitian wants to insure that a certain meal consisting of rice, broccoli, and fish contains exactly 26,800 units of vitamin A, 840 units of vitamin E, and 11,160 units of vitamin C. One ounce of rice contains 400 units of vitamin A, 20 units of vitamin E, and 180 units of vitamin C. One ounce of broccoli contains 800 units of vitamin A, 60 units of vitamin E, and 540 units of vitamin C. One ounce of fish contains 2,400 units of vitamin A, 40 units of vitamin E, and 810 units of vitamin C. How many ounces of each food should this meal include?
 _____rice _____broccoli _____fish
- 12) United express, a nationwide package delivery service charges a base price for overnight delivery of packages weighing 1 pound or less and a surcharge for each additional pound (or fraction thereof). A customer is billed \$29.95 for shipping a 5-pound package and \$59.20 for shipping a 20-pound package. **YOU MUST SOLVE BY SUBSTITUTION OR ELIMINATION**
 a) Find the base price. _____
 b) Find the surcharge. _____
- 13) A B C D E F G H I J K L M
 1 2 3 4 5 6 7 8 9 10 11 12 13
 N O P Q R S T U V W X Y Z
 14 15 16 17 18 19 20 21 22 23 24 25 26
- The following message was encoded with $\begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 1 & 1 & 1 \end{bmatrix}$. Decode this message:
 31 48 56 9 19 28 20 8 28 28 9 28 25 39 44 20 39 39 15 27 27 29 22 36
- 14) A company that manufactures laser printers for computers has monthly fixed costs of \$243,000 and variable costs of \$22.45 per unit produced. The company sells the printers for \$59.95 per unit.
 a) Find the Cost Function _____
 b) Find the Revenue Function _____
 c) How many printers must be sold each month for the company to break even?
- 15) There will be a page of definitions and concepts. So, make sure you know all definitions and criteria for adding subtracting, and multiplying matrices, Also know all concepts of solving a system of equations by graphing, substitution and elimination. Know all about Identity matrices, and Inverse matrices. In short, go over all lecture notes and make sure you know the concepts, not just the process.

Answer Key

Testname: M118-TEST-CHAPTER 4-5-PRACTICE

- 1) $(-2, 3)$
- 2) no solution
- 3) $x=2t + 3$ $y = -3t + 5$ $z = t$
- 4) $x_1 = -2; x_2 = -3; x_3 = -2$
- 5) a) $x = t - 12$ $y = 32 - 2t$ $z = t$ $t = 12, 13, 14, 15, 16$
b) \$5700 8 - 4,500 cubic ft and 12- 6,000 cubic ft cars
- 6) $\begin{bmatrix} 3 & -2 \\ 2 & -1 \end{bmatrix}$
- 7) $(2,4)$
- 8) $(10, 1), (1, 10), (5, 2)$
- 9) Minimum at $(4, 6)$
- 10) \$4.62
- 11) 5 ounces rice, 7 ounces broccoli, 8 ounces fish
- 12) Base price \$22.15 surcharge \$1.95
- 13) Why is this test so long
- 14) a) $C(x) = \$243,000 + 22.45x$
b) $R(x) = 59.95x$
c) 6480 printers Break-even point $(6480, 388,476)$ to the left of the break-even point is loss, to the right is profit
- 15)