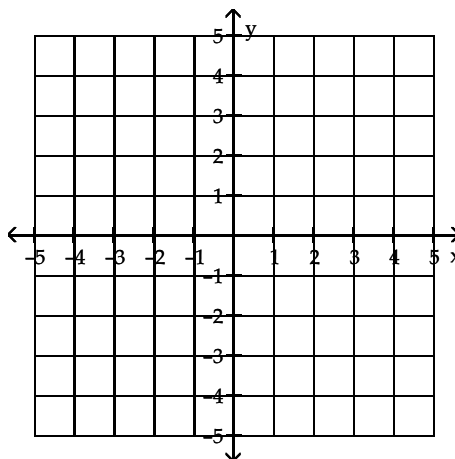


- 1) Solve graphically:  $x + 2y = 4$   
 $2x + y = -1$



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

- 3) 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?

- 4) 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

- 5) **Set up a system of linear equations and solve using MATRIX INVERSE METHODS.**

Labor and material costs for manufacturing two guitar models are given in the table:

Guitar Model	Labor Cost	Material Cost
A	\$30	\$20
B	\$40	\$30

- a) How many of each model should be produced each week to use exactly each of the allocations indicated in the following table?

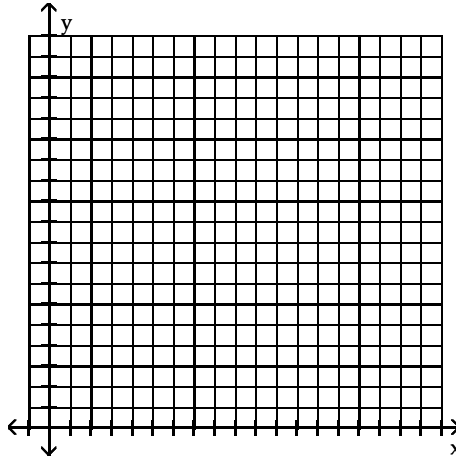
	1	2	3
Labor	\$1800	\$1750	\$1720
Material	\$1200	\$1250	\$1280

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

$$x + y \leq 11$$

$$x + 5y \geq 15$$

$$2x + y \geq 12$$



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

8)

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

9) 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 \_\_\_\_\_

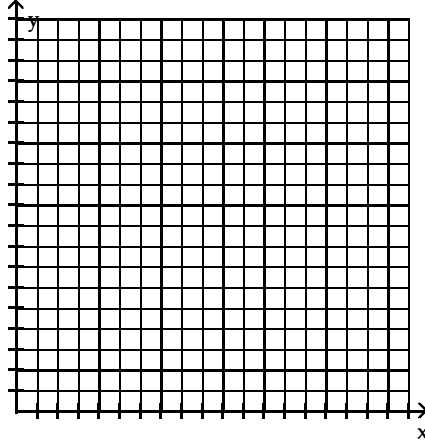
c) How many printers must be sold each month for the company to break even?

10) A furniture company manufactures tables and chairs. It takes 8 hours of assembly time and 2 hours of finishing time to produce a table. It takes 2 hours of assembly time and 1 hour of finishing time to produce a chair. The maximum number of assembly hours available each day is 400 and the maximum number of finishing hours available is 120. There is a \$90 profit on each table and a \$25 profit on each chair.

a) How many tables and chairs should be manufactured each day to maximize profit?

b) What is the maximum profit? \_\_\_\_\_

c) If the profit on a chair is increased to \$50 and everything else stays the same, what would be the new maximum profit? \_\_\_\_\_



## Answer Key

Testname: M118-TEST1-NEW-PRACTICE-TEST.TST

- 1)  $(-2, 3)$
- 2)  $x=2t+3$        $y=-3t+5$        $z=t$
- 3) 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
- 4) 5 ounces rice, 7 ounces broccoli, 8 ounces fish
- 5) a) week one 60 model A    0 model B  
b) week two 25 model A    25 model B  
c) week three 4 model A    40 model B
- 6)  $(10, 1), (1, 10), (5, 2)$
- 7)  $\begin{bmatrix} 3 & -2 \\ 2 & -1 \end{bmatrix}$
- 8) Why is this test so long
- 9) 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
- 10) a) 40 tables, 40 chairs  
b) \$4600  
c) \$6000 when 120 chairs are produced