1. Find the slope. The line that passes through points (2, 1) and (4, –6).

2. Find the slope. $2x + y = 4$

3. Find a general equation for the line having the given properties.
   Slope = 4; containing (–3, 4)

4. **Without solving**, determine whether the lines below are perpendicular, coincidental, or parallel.
   $L: -2x + 3y + 8 = 0$
   M: $2x - 3y + 6 = 0$

6. Write the augmented matrix of
   $3x + y = 4 \qquad x - 3y = 8$

   Do not solve.

7. Perform the row operation $R_2 = (-2)r_1 + r_2$ on the matrix
   $\begin{bmatrix} 1 & 5 & -6 \\ 6 & -1 & 2 \end{bmatrix}$

8. Write the solution of the following matrix.
   $\left[\begin{array}{ccc|c} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 3 \end{array}\right]$

9. What is the dimension of the matrix shown below?

$$\begin{bmatrix} 2 & 1 & 4 \\ 1 & 3 & 5 \\ -2 & 0 & 1 \\ 6 & 0 & 1 \end{bmatrix}$$

10. Find:

$$4\begin{bmatrix} 1 & -3 & 1 \\ 0 & 2 & 1 \end{bmatrix} - \begin{bmatrix} 8 & -1 & 1 \\ 2 & 0 & 1 \end{bmatrix}$$

11. a. If A is a matrix of dimension 2×3 and B is a matrix of dimension 3×5, is AB defined?

    b. If so, what is its dimension?

    c. Is BA defined?

    d. If so, what is its dimension?

12. Find:

$$\begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}\begin{bmatrix} 4 & 3 \\ 0 & 1 \end{bmatrix}$$

14. Compute the transpose of A = $\begin{bmatrix} 2 & 3 & 0 \\ 1 & -1 & 5 \end{bmatrix}$

15. Introduce slack variables and set up the initial tableau. **Do not solve.**

Maximize $P = 8x_1 + 2x_2 + 3x_3$

subject to the constraints $x_1 + 3x_2 + 2x_3 \le 10$ $\quad x_1 \ge 0,\ x_2 \ge 0,\ x_3 \ge 0$

$4x_1 + 2x_2 + 3x_3 \le 8$

16. Find the Pivot element for

x_1	x_2	s_1	s_2		
1	1/2	1/4	0	30	x_1
0	1	−1/2	1	20	s_2
0	−1	1	0	120	

Do not Solve.

17. Find the solution of the following **final** tableau

x_1	x_2	s_1	s_2		
6	0	1	4	10	s_1
2	1	0	8	5	x_2
5	–1	0	10	25	

19. A company makes three products, A, B, and C. There are 500 pounds of raw material available. Each unit of product A requires 2 pounds of raw material, each unit of product B requires 2 pounds of raw material, and each unit of product C requires 3 pounds of raw material. The assembly line has 1,000 hours of operation available. Each unit of product A requires 4 hours of assembly, while each unit of products B and C requires 5 hours. The company realizes a profit of $500 for each unit of product A, $600 for each unit of product B, and $1,000 for each unit of product C. How many units of each of the products should the company make to maximize the profit? DO NOT SOLVE THIS PROBLEM. JUST SET UP THE PROBLEM AND WRITE THE INITIAL TABLEAU WITH THE SLACK VARIABLES.

Use the following to answer questions 23-26:

In the game Over-and-Under, a pair of dice is rolled and one bets $1 whether the sum of dots showing on the two dice is *over 7, under 7, or exactly 7* with payoffs of $2, $2, and $5, respectively. Determine a person's expected net winnings if the bet is as indicated.

23. Over 7

24. Under 7

25. Exactly 7

26. Is the game fair?

27. A box contains 4 defective and 8 good light bulbs. If 3 bulbs are selected at random. What is the probability that exactly one is good?

28. Four percent of the items coming off an assembly line are defective. If the defective items occur randomly and ten items are chosen for inspection, what is the probability that exactly two items are defective?

29. Calculate the following binomial probability:
Find the probability of getting 6 successes out of 9 when the probability of a success is 90%.

35. Use the following sample: 28, 30, 24, 30, 32, 40, 22, 25, 26, 34
Find the *z*-score for 30. (Assume a normal distribution.)

36. A probability distribution has an expected value of 28 and a standard deviation of 4.
Find the area under the standard normal curve between 20 and 36

Use the following to answer questions 37-38:

Using *z*-scores, what is the area under the standard normal curve?

37. To the left of 1.8?

38. Between –2.20 and 1.36