For #1-2, Z denotes the standard normal random variable.

21. Find Pr(Z ≥ 2.5)

a) 0.0124   b) 0.9938   c 2.5   d) 0.4938   e) 0.0062

22. Find Pr(-1 ≤ Z ≤ 1.5).

a) 0.7745   b) 0.9932   c) 1.0919   d) 0.2245e) 0.4932

For #3-5, X denotes the normal random variable with
μ = 4 and σ = 2.

23. Find Pr(X ≤ 8)

a) 0.0028   b) 0.4972   c) 1.0000   d) 0.9772   e) 0.0228

24. Find Pr(X ≥ 0)

a) 0.0028   b) 0.5000   c) 0.9772   d) 1.0000   e) 0.6015

25. Find Pr(1 ≤ X ≤ 5)

a) 0.6915   b) 0.6247   c) 0.7588   d) 0.1587   e) 0.3758

26. SAT scores in Terra America are distributed normally with a mean of 900 and a standard deviation of 100. The TACAA has a rule that no high school senior can be awarded an athletic scholarship unless she/he has an SAT score of at least 700. Under this rule, what percent of high school seniors are **ineligible** for athletic scholarships?

a) 1.14%   b) 97.72%   c) 100%   d) 50%   e) 2.28%

27. Northworst Airlines has discovered that the lateness of its flights is normally distributed with standard deviation 10 minutes. (A flight that arrives 5 minutes early is considered -5 minutes late). Northworst can change the average lateness by adjusting the schedule -- note that this does <u>not</u> change the standard deviation. What should the average lateness (in minutes) be so that at most 5% of Northworst's flights are more than 15 minutes late?

a) -1.5   b) 1.5   c) - 41   d) -14.75   e) 3.15

28. United Distress has found that the lateness of its flights is normally distributed with mean 30 minutes late and standard deviation 20 minutes. (A flight that arrives 5 minutes early is considered -5 minutes late.) What is the probability that a United Distress plane is actually on time? (That is, at most 0 minutes late)   a) 0.9394   b) 0.9332   c) 0.0668   d) 0.0334   e) 0.4332

29. A certain class takes a 25 question multiple choice test. Each question has 5 possible answers, of which only one is correct. Use an approximating normal curve to estimate the probability that a person who guesses randomly on every question will get **at least** 10 questions correct.

a) 0.0122   b) $C(25,10)\left(\frac{1}{5}\right)^{10}\left(\frac{4}{5}\right)^{15}$ c) 0.1056   d) 10/25   e) 0.0062

30. Two lines are in the xy plane and the number of points common to both lines is discovered. Which of the following numbers <u>cannot</u> describe the <u>exact</u> number of points of intersection?

a) infinitely many   b) 0   c) 1   d) 3

1

31. The entry in the first row and second column of the inverse of $T = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ is

a) - 2 b) 2/10   c) - 2/10   d) - 2/14   e) T has no inverse

32. Find the y-intercept of the line through the points (6,7) and (2, 5).

a) 1   b) 4   c) - 8 d) 1/2   e) 5

33. Which of the following points satisfies $x + 2y \leq 5$?

a) (10, -1)   b) (2, 3)   c) (3, 2)   d) (-1, 5)   e) (1, 2)

34. Which of the following graphs is the graph of
$$x + 2y \leq 5$$
$$3x - 2y \geq 7$$
(Note: The **unshaded** region of the graph is the feasible set.)

35. Which of the following is <u>not</u> an elementary row operation?

a) multiplying a row by 3   b) interchanging two rows   c) subtracting 1 from each element of a row

d) adding 5 times one row to another row.   e) subtracting one row from another row

36. Find z-coordinate of the solution of:

$$x + 2y + 3z = 14$$
$$2x + y \qquad = 4$$
$$2y + z = 7$$

a) 0   b) 2   c) 1   d) 3   e) there is no solution

37. Find the z coordinate of the solution of:

$$x + 2y - z = 3$$
$$3x + 8y + z = 7$$
$$2x + 5y = 8.$$

a) z can be anything   b) there is no solution   c) 4   d) 3   e) 1

38. The equation of the line through (1, 2) with slope -5 is:

a) $y = (-x + 11)/5$ b) $y = -5x - 5$ c) $y = -5x + 7$ d) $y = -5x + 11$ e) $y = 2x - 5$

39. Multiply: $\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}$

a) The matrices cannot be multiplied   b) $\begin{bmatrix} 7 & 8 \\ 14 & 16 \end{bmatrix}$ c) $\begin{bmatrix} 6 & 2 \\ 4 & 8 \end{bmatrix}$ d) $\begin{bmatrix} 5 & 3 \\ 5 & 6 \end{bmatrix}$ e) $\begin{bmatrix} 14 & 7 \\ 18 & 9 \end{bmatrix}$

40. Assuming that 39% of all people have brown eyes, 32% have blue eyes, and 28% have green eyes, what is the probability that exactly 112 people out of a group of 20 randomly selected people have brown eyes?

a. $\binom{20}{12} (0-39)^{12} (0 \cdot 61)^8$ b. $\binom{20}{8} (0 \cdot 39)^8 (0 \cdot 61)^{12}$ c. 0.39

d. $\binom{20}{12} (0.39)^{12}$ e. Not enough information is given to answer the question