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A DESCRIPTION OF THE ADVANCED PLACEMENT TEST FOR CREDIT IN MATHEMATICS 1324

This is a two-hour multiple-choice test. There are twenty-five questions, and you must answer at least seventeen correctly in order to pass. There is no penalty for wrong answers.

You will need a calculator with a y^x function.

The questions were chosen from the following topics:

- Cartesian coordinate systems and straight lines
- Systems of linear equations, matrices, and Gauss-Jordan elimination
- Systems of linear inequalities in the plane
- Linear programming in two dimensions
- Simple and compound interest
- Annuities, sinking funds, and amortization
- Permutations, combinations, and the multiplication principle in probability
- Sample spaces, experiments, probability of an event, and odds
- Empirical probability
- Random variables, probability distributions and expectations
- Union, intersection, and complement of events
- Conditional probability and independence
- Bayes' formula
- Measures of central tendency and dispersion
- Binomial trials and binomial distributions
- Normal distributions

Listed below are some sample questions.

1. Solve the following system of equations.

$$\begin{aligned} 2x_1 - 2x_2 + x_3 &= 3 \\ 3x_1 + x_2 - x_3 &= 7 \\ x_1 - 3x_2 + 2x_3 &= 0 \end{aligned}$$

A) $x_1 = 1, \quad x_2 = -3, \quad x_3 = 0$
B) $x_1 = 2, \quad x_2 = 0, \quad x_3 = -1$
C) $x_1 = 3, \quad x_2 = -2, \quad x_3 = 5$
D) $x_1 = -2, \quad x_2 = 4, \quad x_3 = 3$
E) None of the preceding

2. Maximize $P = 3x_1 + x_2$ subject to $2x_1 + x_2 \le 20$, $10x_1 + x_2 \ge 36$, $2x_1 + 5x_2 \ge 36$, and $x_1, x_2 \ge 0$.

A) 28
B) 22
C) 15
D) 32
E) None of the preceding

3. Suppose that a $1,000 debt is amortized in 6 equal monthly payments at 1.25 percent interest per month on the unpaid balance. What is the total interest paid?

A) $75.00
B) $12.50
C) $44.21
D) $53.76
E) None of the preceding

4. What is the variance of a binomial distribution with n = 10 and p = 0.8?

A) 80
B) 20
C) 2
D) 8
E) None of the preceding