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.
   \[
   \begin{align*}
   2x_1 - 2x_2 + x_3 &= 3 \\
   3x_1 + x_2 - x_3 &= 7 \\
   x_1 - 3x_2 + 2x_3 &= 0
   \end{align*}
   \]
   A) \(x_1 = 1, \ x_2 = -3, \ x_3 = 0\)
   B) \(x_1 = 2, \ x_2 = 0, \ x_3 = -1\)
   C) \(x_1 = 3, \ x_2 = -2, \ x_3 = 5\)
   D) \(x_1 = -2, \ x_2 = 4, \ x_3 = 3\)
   E) None of the preceding

2. Maximize \(P = 3x_1 + x_2\) subject to \(2x_1 + x_2 \leq 20, \ 10x_1 + x_2 \geq 36, \ 2x_1 + 5x_2 \geq 36,\) and \(x_1, x_2 \geq 0\).
   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