

Mathematics 210-1, MIDTERM II, November 19, 2002

1. (10 points) A church sells 5,000 lottery tickets at \$5 each. The prize is a new car worth \$20,000. If you buy one ticket, what is your expected winning?

2. (10 points) The following data is from a local cat show.

<i>Weight (in pounds)</i>	<i>Frequency</i>
8	4
9	3
10	0
11	1
12	2
13	2

(a) Construct a histogram and a frequency polygon that displays this information.

(b) Find the mean weight for a cat in the competition.

(c) What is the median weight?

(d) What weight is the mode?

3. (15 points) *Normal Distribution.* The average score on a mathematics placement test is 60, with a standard deviation of 8. If 500 students take the test, how many students would you expect to score between 52 and 68?

4. (15 points) A professor gives a test with 100 true-false questions. If 60 or more correct is necessary to pass, what is the probability that a student will pass by random guessing?

5. (13 points) Use the Gauss-Jordan method to solve the following system.

$$\begin{aligned}2x - 3y &= -4 \\x - 2y + 3z &= 0 \\3x + 2y + z &= 8\end{aligned}$$

6. (12 points) Let $A = \begin{pmatrix} 6 & 3 \\ 7 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$.

Find $A + B$, $A - B$, $A \cdot B$, $B \cdot A$, if possible. If it is impossible explain why.

7. (10 points) Graph the feasible region for the system.

$$\begin{aligned}x &> -2 \\-1 &< y < 1 \\x + y &\leq 1\end{aligned}$$

8. (15 points) Use the graphical method to solve the linear programming problem.

Maximize $z = x - y$

subject to: $x + y \leq 3$

$$2x + y \leq 4$$

$$x \geq 0$$

$$y \geq 0.$$