

Math 1010 – Final Exam Spring 2006

NAME: _____

Circle your Instructor:

Briggs

Kammerling

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Yacoub

Instructions to be read carefully! The exam will last for three hours. You may use a book, notes, and a calculator. *Circle your answers to the multiple choice problems clearly. Your solutions to the partial credit questions must be detailed and complete, showing all relevant work.* Multiple choice problems are worth 4 points each (60 points total). Partial credit problems are worth 10 points each (100 points total). The exam is worth 160 points. Good luck!!

Multiple Choice (4 points each): _____

Partial Credit (10 points each):

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Total (160 points): _____

NAME: _____

Multiple Choice (4 points each)

1. Larry doesn't own a cat, so he must own a dog. What fallacy is being used here?
 - A. Hasty generalization.
 - B. Limited choice.
 - C. False cause.
 - D. Circular reasoning.
 - E. Diversion.

2. In a group of 30 dogs, 13 have short tails, 11 have long ears, and 8 have neither. How many of the dogs have both short tails and long ears?
 - A. 2
 - B. 24
 - C. 22
 - D. 11
 - E. Impossible – it would have to be a negative number.

3. Given that 3 feet = 1 yard, how many square feet are there in 18 square yards?
 - A. 6
 - B. 54
 - C. 2
 - D. 162
 - E. None of the above.

4. Beth was earning \$15.00 per hour. She received a 10% pay raise, then business went bad and she took a 10% pay cut. What is her current hourly rate?
 - A. \$15.00
 - B. \$13.50
 - C. \$13.64
 - D. \$14.85
 - E. None of the above.

5. $X = 3.5 \times 10^{12}$ and $Y = 7 \times 10^{24}$. Find $\frac{Y}{X}$.
 - A. 2×10^2
 - B. 5×10^{-3}
 - C. 2×10^{12}
 - D. 5×10^{-13}
 - E. None of the above.

6. This semester, a study was done to determine engagement in the learning process by MATH 1010 students. Students were asked to volunteer for the study and several students from each section were chosen to participate. Which of the following statements are true?

- A. The fact that students had to volunteer to participate is a possible source of bias.
- B. The results can not be valid because not all MATH 1010 students were included.
- C. This was an experiment.
- D. The sampling method used was *simple random sampling*.
- E. None of the above.

7. A battery company wants to know the average life of its batteries. They randomly select 200 batteries and record the amount of time until they run out when used in the same model flashlight. The average life of the batteries in these flashlights is 520 minutes. Which of the following are true?

- A. All of the batteries last for exactly 520 minutes in this model of flashlight.
- B. 520 minutes is a population parameter rather than a sample statistic.
- C. It is reasonable to assume that on average the batteries last 520 minutes in this model of flashlight.
- D. This study has possible participation bias.
- E. This is a case-controlled study.

8. To be ready for a night on the town Claire needs to wear a dress, a hat and a pair of shoes. She own 4 dresses, 3 hats and 5 pairs of shoes. How many different ways can she get ready for her night on the town?

- A. 12
- B. 60
- C. 150
- D. 17280
- E. None of the above.

9. Suppose the probability of event A is $P(A) = 0.2$ and the probability of event B is $P(B) = 0.5$. If A and B are independent, what is $P(A \text{ and } B)$?

- A. 0.10
- B. 0.30
- C. 0.70
- D. 0.90
- E. Can not be determined from the information given.

10. On day one I pay you \$2, on day two \$4, on day three \$6, on day four \$8, etc. What type of growth is this?

- A. Linear, because the increase each day is constant.
- B. Linear because each day's pay is a power of two.
- C. Exponential, because the increase each day is constant.
- D. Exponential, because each day's pay is a power of two.

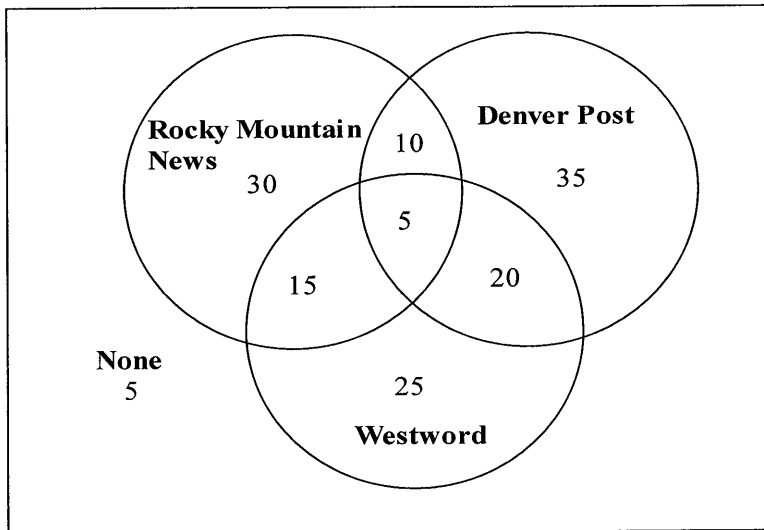
11. The price of corn in a country increase at a rate of 5% per year. What is the approximate doubling time of the prices?

- A. 10 years.
- B. 14 years.
- C. 20 years.
- D. 25 years.
- E. None of the above.

12. One liter is equal to 1.06 quarts. Which of the following is true.

- A. One quart is smaller than one liter
- B. One liter is smaller than one quart.
- C. One quart is equal to 0.96 liters.
- D. Two quarts is less than one liter.
- E. None of the above.

The diagram to the right shows the results of a survey of 145 people who were asked to indicate which of three Denver newspapers they read regularly. Some people read more than one newspaper. For example, 15 people read both the Rocky Mountain News and Westword, but not the Denver Post. Use this diagram for questions 13–14.



13. How many people read the Denver Post and the Rocky Mountain News and only those newspapers?

- A. 15
- B. 10
- C. 5
- D. 20
- E. 65

14. How many people read at least two newspapers?

- A. 15
- B. 10
- C. 45
- D. 20
- E. 50

15. Suppose you make a one-time deposit of \$500 into a savings account. Which of the following is true?

- A. The balance in the account after one year is greater if interest is compounded annually compared to daily.
- B. The balance in the account after one year is greater if the APR is 6.6% compared to 6.8%.
- C. The annual percentage yield (APY) is not less than the APR.
- D. The balance in the account does not depend on the initial balance.
- E. All of these statements are false.

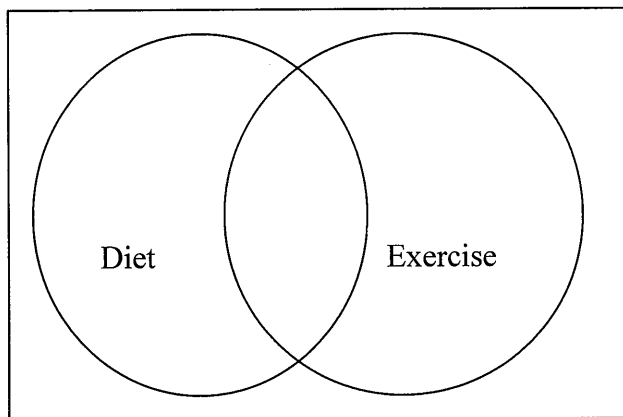
Partial Credit Questions (10 points each)

1. A recent survey was done on a group of 640 people who were trying to lose weight. The people in the sample were asked if they dieted, if they exercised, if they did both, or if they did neither. A total of 140 people dieted and a total of 240 people exercised, and 40 people both dieted and exercised.

a. Fill out the blank spaces in the table below.

	Diet	No diet	Total
Exercise	40		240
No exercise			
Total	140		640

b. Construct a Venn diagram with numbers using two labeled circles to display the results of the study.



2. You want to buy a new car, but plan to use it for only 2 years. If you lease the car you will pay \$1000 up front and \$300 per month. After the lease expires, the car is returned and you owe nothing. If you buy the car for \$20,000 you can expect to sell it in two years for approximately \$12,000. Which is the better option? Explain your choice in mathematical terms.

3. Susanna deposits \$150 per month into a savings plan that earns interest at a rate of 7.2% compounded monthly.

a. What is the balance in the account after 20 years?

b. How much did Susanna deposit into the account over 20 years?

4. Suppose you take out a loan for \$150,000 for a new house. You find a loan with an interest rate of 6.2% with a payback period of 20 years.

a. What are your monthly payments for the loan?

b. When the loan is paid off, how much have you paid in monthly payments?

5. Find the probability of the following events.

a. Tossing two coins and getting one head and one tail.

b. Meeting a person at random who was born in June, July or August.

6. Find the probability in the following situations.

a. A mathematics class has 12 males and 11 females. A committee of four people is selected at random from the class. What is the probability that the committee will consist of four males?

b. Suppose that one of five students currently enrolled at CU-Denver has allergies. What is the probability that at least one of the next eight students that you meet (at random) has allergies?

7. An eight-character Internet address must be four letters of alphabet (not case-sensitive) followed by a four-digit number (using numerals 0–9). In how many different ways can this be done if

a. repetition is permitted?

b. repetition is not permitted?

8. Find the number of arrangements in the following situations.

a. How many ways can a four-runner relay team be selected from a team of eight runners?

b. How many different ways can four numbered balls be selected from a lottery barrel with balls numbered 1 through 20?

9. In the year 2000, the population of Colorado was 4.3 million and the population of Arizona was 5.1 million. Complete the following sentences:

a. The population of Colorado was ____ percent less than the population of Arizona.

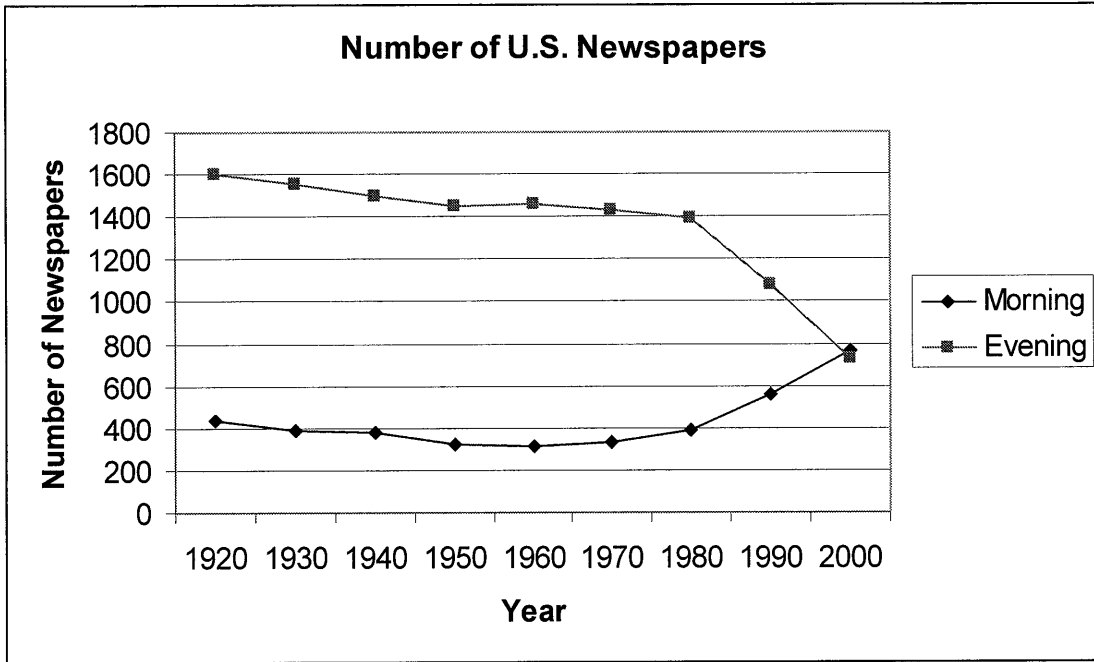
b. The population of Arizona was ____ percent greater than the population of Colorado.

10. The graph below shows the number of different U.S. morning and evening newspapers in circulation between 1920 and 2000.

a. Approximately how many different evening papers were in circulation in 1980?

b. Which is greater, the total number of newspapers (morning and evening) in 1920 or the total number of newspapers in 2000.

c. In 2000, what percentage of all newspapers in circulation were morning newspapers?



Have a good summer!