

FILE COPY

**Math 1010 – Final Exam
Spring 2004**

NAME: _____

Circle your Instructor: Briggs Cozzens Kammerling Olson

You are allowed to use open book, open notes, and a calculator. The exam will last three hours. Your solutions must be detailed and complete. You may work on scratch paper, but you must transfer all relevant work to the exam. On all questions, circle your final answer clearly. Good luck!!

Short problems

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____
- 15. _____

Total _____

Long problems

- 16. _____
- 17. _____
- 18. _____
- 19. _____
- 20. _____
- Total _____

Total _____

NAME: _____

Short Answer

1. Last year the annual global production of oil was 28 billion barrels. Write this number in scientific notation.

2. If your living room floor is a rectangle that measures 22 feet by 15 feet, how many square yards of carpet are needed to cover it?

3. The speed limit on the German autobahn is 160 kilometers per hour. If you are traveling 80 miles per hour, are you exceeding the speed limit? Explain your answer.

4. A politician claims that he will cut your taxes by 10% per year for each of the next three years. What will the total percentage tax cut be over three years?

5. An advertisement claims that 2 out of 3 people drive American cars, so you should buy an American car. What informal fallacy might be at work here?

6. Draw a Venn diagram to represent a group 50 people where 20 are lawyers, 25 are senators and 10 are neither.

7. If there are 2.2 pounds in one kilogram, how many kilograms are there in one pound?

8. A recent study published in the *British Journal of Medicine* concluded that soft drinks contribute to obesity in children. The study was conducted by randomly dividing the sample into two groups, one of which was confined to a diet without soft drinks. What kind of statistical study (pure observational, case-control observational, experiment) was used to reach this conclusion?

9. Suppose a six-person jury must be selected from a pool that has 12 men and 9 women. How many different juries can be selected?

10. Suppose a six-person jury must be selected from a pool that has 12 men and 9 women. What is the probability that the first three people selected are women?

11. During a flu epidemic, 1 of every 20 people on campus was infected with a flu virus. What is the probability that among the first 10 people you meet randomly on campus, at least one is infected with the virus?

12. Suppose the balance in your savings account increases by a steady 3% per year. In how many years will your balance double in size?

13. Suppose a population of termites doubles in size every 3 weeks. Starting with an initial population of 100 termites, what will the population be after 10 weeks?

14. Registration of hybrid cars in America increased by 25% to 43,400 during 2003. How many hybrid vehicles were registered at the beginning of 2003?

15. Would you rather have a bank account in which the balance doubles every 17 years or increases by 6% per year? Explain your answer.

Partial Credit

16. The following table shows the voting record of a sample of 300 voting-eligible Americans in the last national election (based on actual data).

	Voted	Did not vote
Age 18–24	42	60
Age over 24	140	58

- a. What percentage of people in the sample aged 24 and under voted in the last election?

- b. What percentage of all people in the sample did not vote in the last election?

- c. What is the probability that if you meet one of the 300 people in the sample randomly that s/he is a person under 25 who voted?

- d. Draw a Venn diagram with two circles that represents these data.

17. Suppose you invest \$150 per month towards a college fund in an account that pays 7.5% interest compounded monthly.

a. Assuming an initial balance of zero dollars, how much will be in the account in 20 years?

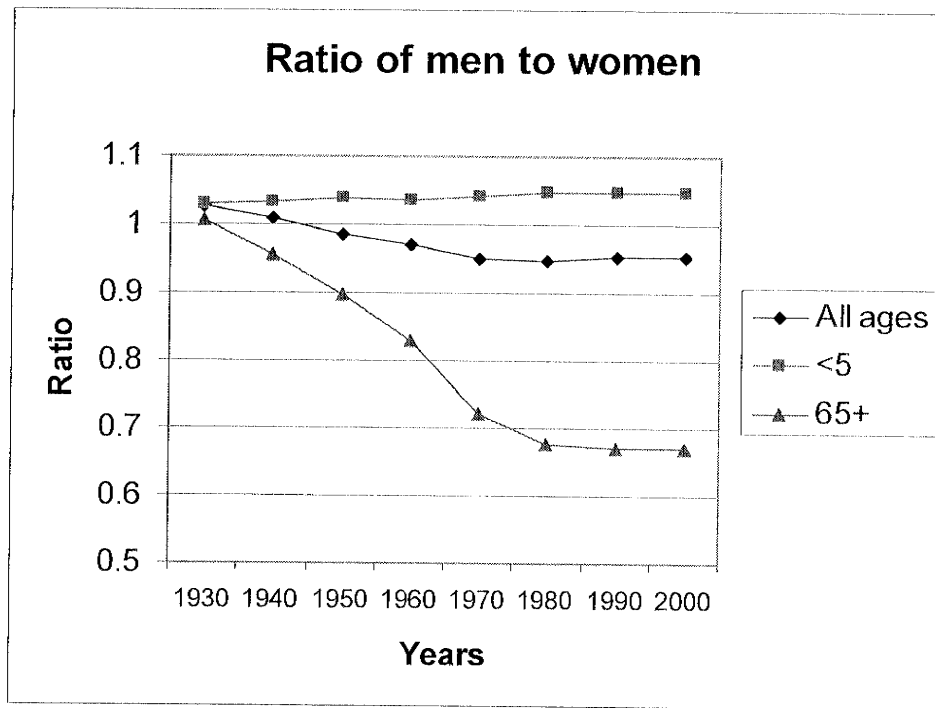
b. How much of the final balance will be due to interest?

18. Sally took out a 30-year mortgage for \$150,000 at an annual rate of 6.5%.

a. How much are her monthly payments?

b. How much will she have paid out over the life of the mortgage?

19. Consider the graph below that shows the ratio of men to women in the United States in various age groups since 1930.



a. Among young children under 5 years of age, have there been more boys or girls during the years since 1930?

b. Since about 1980, how many men over 65 are there for every 100 women over 65?

c. In what year did women first outnumber men over all age groups?

d. What does this graph say about the life expectancy of American women compared to American men?

20. Suppose you are considering buying a health insurance policy that will cover 80% of your medical expenses after the first \$200 of expenses. The annual premium for the policy is \$450 per year. From your records over the last three years, you know that you spend an average of \$900 per year in medical expenses. Based on this record of medical expenses and assuming that your goal is to save money, would you buy the insurance policy? Explain.

HAVE A GOOD SUMMER!