

Review for Exam 1
Math 123

Use a proportion to solve the problem.

- 1) If a spring stretches 6 meters when a 4-kilogram weight is attached to it, how much will it stretch when a 20-kilogram weight is attached to it?
- 2) The ratio of the lengths of strings that play the notes F and G is 9 to 8. If a string 48 centimeters long plays a G, what is the length of the string that plays an F?
- 3) The ratio of the distances a 7-iron and a 5-iron will drive a golf ball is 5 to 6. If a golfer averages 116 yards with a 7-iron, how far should he average with a 5-iron?
- 4) On a map of the Thunderbird Country Club golf course, 1.5 inches represent 45 yards. How long is the 8th hole if the map shows 14.5 inches?
- 5) Jim drove 250 miles in 5 hours. If he can keep the same pace, how long will it take him to drive 1450 miles?
- 6) In a sample of 94 widgets, 3 were defective. How many defective widgets would you expect in a sample of 188 widgets?

Rewrite the following as indicated.

- 7) $\frac{3}{4}$ (Write as a percent.)
- 8) $\frac{19}{30}$ (Write as a percent.)
- 9) $\frac{17}{25}$ (Write as a percent.)
- 10) 0.41 (Write as a percent.)
- 11) 0.189 (Write as a percent.)

12) $6\frac{1}{4}\%$ (Write as a decimal.)

13) $\frac{1}{6}\%$ (Write as a decimal.)

Solve the problem.

- 14) An outlet store had monthly sales of \$98,800 and spent 8% of it on legal fees. How much was spent on legal fees?
 - 15) The First Commerce Bank pays $4\frac{1}{2}\%$ interest per year on growth fund accounts. What is the annual income on a growth fund account of \$107,200? Round to the nearest dollar.
 - 16) A decorator has 52 clients, 25% of whom are businesses. Find the number of business clients.
 - 17) Students at Maple School earned \$720 selling candles. They want to accumulate \$2000 for a club trip. What percent of their goal has been reached?
 - 18) Alex has saved \$448 at the bank. He wants to accumulate \$1750 for a trip to soccer camp. What percent of his goal has been reached?
 - 19) On a biology test, a student got 25 questions correct but did not pass. On a second attempt, the student got 35 questions correct. What was the percent of increase?
 - 20) By switching service providers, a family's telephone bill decreased from about \$50 a month to about \$42. What was the percent of decrease?
- Find the simple interest and the final value of the deposit that earns the given rate for the indicated length of time. Round your answers to the nearest cent.
- 21) \$8116 earning 11% for 2.7 years

22) \$12,160 earning 9% for 1.2 years

Find the compound interest earned by the deposit. Round to the nearest cent.

23) \$3000 at 6% compounded annually for 13 years

24) \$300 at 12% compounded quarterly for 3 years

25) \$1060 at 5% compounded annually for 15 years

26) \$1540 at 10% compounded semiannually for 12 years

Solve the problem.

27) You just put \$4549 in a CD that is expected to earn 14% compounded monthly, and \$9589 in a savings account that is expected to earn 3% compounded annually. Determine when, to the nearest year, the values of your two investments will be the same.

28) You have money in an account at 4% interest, compounded quarterly. To the nearest year, how long will it take for your money to double?

List the elements in the sample space of the experiment.

29) A 6-sided die is rolled. The sides contain the numbers 1, 2, 3, 4, 5, 6. List the sample space of rolling one die.

30) A box contains 3 blue cards numbered 1 through 3, and 4 green cards numbered 1 through 4. List the sample space of picking a blue card followed by a green card.

Determine the number of outcomes as requested.

31) Two 6-sided dice are thrown. Determine the number of ways that a score of 8 can be obtained.

32) If a single card is drawn from a standard 52-card deck, in how many ways could it be an ace or a spade?

Find the probability.

33) Two dice are rolled. Find the probability that the score on the dice is 2.

34) Two dice are rolled. Find the probability that the score on the dice is 12.

35) Two dice are rolled. Find the probability that the score on the dice is either 6 or 10.

36) Two dice are rolled. Find the probability that the score on the dice is an even number.

37) When a single card is drawn from an ordinary 52-card deck, find the probability of getting a black card.

38) When a single card is drawn from an ordinary 52-card deck, find the probability of getting a jack.

39) When a single card is drawn from an ordinary 52-card deck, find the probability of getting a club.

40) When a single card is drawn from an ordinary 52-card deck, find the probability of getting the 2 of diamonds.

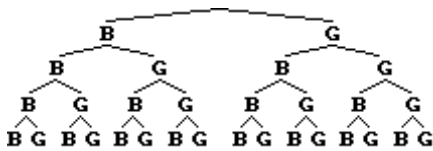
41) When a single card is drawn from an ordinary 52-card deck, find the probability of getting a red 9 or a black 2.

42) A bag contains 8 red marbles, 9 blue marbles, and 5 green marbles. What is the probability of choosing a blue marble?

43) A bag contains 5 red marbles, 2 blue marbles, and 1 green marble. What is the probability of choosing a marble that is not blue?

Construct the requested tree diagram.

- 44) Construct a tree diagram that shows all possible outcomes when two coins are tossed.
- 45) Construct a tree diagram that shows all possible outcomes when three coins are tossed.
- 46) Clark is selecting new eyeglasses. He can choose styles A, B, or C in either the color black or orange. Construct a tree diagram that shows all possible choices that Clark can make.
- 47) Use the tree diagram to count how many four-child families have two boys and two girls.

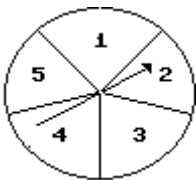


Two marbles are drawn one after the other from a box with 3 white, 2 green, 2 red, and 1 blue marble. Find the probability.

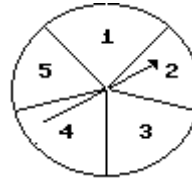
- 48) Both marbles are white.
- 49) The first marble is red and the second marble is white.
- 50) Both marbles are red.
- 51) One marble is green and one marble is red.

Solve the problem.

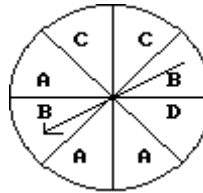
- 52) What is the probability that the arrow will land on 4 or 1?



- 53) What is the probability that the arrow will land on an odd number?



- 54) What is the probability of spinning an A on this spinner?



- 55) Assume that the probability is $\frac{1}{2}$ that a child born is a boy. What is the probability that both of a family's two children are girls?
- 56) Assume that the probability is $\frac{1}{2}$ that a child born is a boy. What is the probability that of the four children in a family two are girls and two are boys?
- 57) A husband and wife have a $\frac{2}{3}$ probability of passing on brown eyes to their children. If they have three children, what is the probability that the children will all have brown eyes?

- 58) Suppose you buy 1 ticket for \$1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be \$500. What are your expected winnings?

- 59) Suppose you pay \$1.00 to roll a fair die with the understanding that you will get back \$3.00 for rolling 2 or 4. What are your expected winnings?

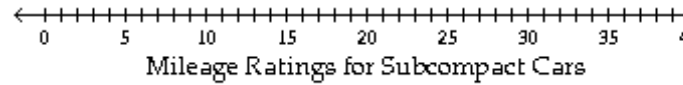
- 60) Suppose a charitable organization decides to raise money by raffling a trip worth \$500. If 3,000 tickets are sold at \$1.00 each, find the expected value of winning for a person who buys 1 ticket.
- 61) A musician plans to perform 3 selections. In how many ways can she arrange the musical selections?
- 62) In how many ways can 7 people line up for concert tickets?
- 63) How many ways can a president, vice-president, and secretary be chosen from a club with only 3 members?
- 64) How many ways can the letters ABCD be arranged?
- 65) How many relay teams of 4 members can be chosen from a 5 member team to run in a relay race?
- 66) How many ways can a president, vice-president, and secretary be chosen from a club with 11 members?
- 67) A baseball manager has 11 players of the same ability. How many 9 player starting lineups can he create?
- 68) There are 8 women running in a race. How many first, second, and third place possibilities can occur?
- 69) A musician plans to perform 5 selections for a concert. If he can choose from 9 different selections, how many ways can he arrange his program?
- 70) How many ways can a committee of 5 be selected from a club with 10 members?

- 71) If the police have 8 suspects, how many different ways can they select 5 for a lineup?
- 72) In how many ways can a group of 6 students be selected from 7 students?

Create the requested statistical graph.

- 73) The mileage ratings for city driving of various subcompact cars are listed below. Construct a line plot using the data.

27 28 10 26 34 27 21 20 19 25 17 29
28 13 23 38 19 32 25 14 11 21 28 24



- 74) The weights of 22 members of the varsity football team are listed below. Draw an ordered stem-and-leaf plot for the data.

144 152 142 151 160 152 131 164 141 153 144
175 156 147 133 172 159 135 159 148 140 171

Weights of 22 Members of the Varsity Football Team

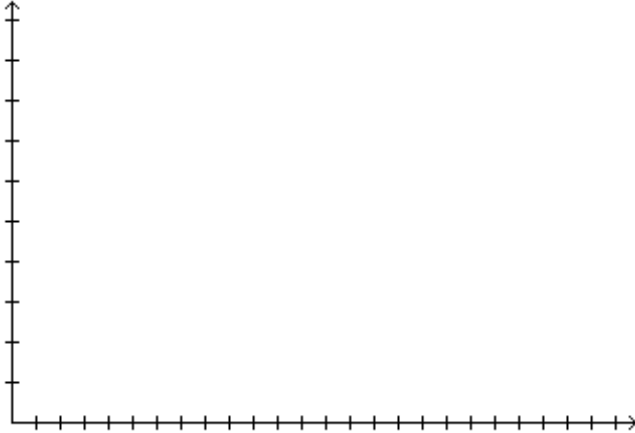


- 75) The data below give the figures for the United States production of canned fruit from 1970 to 1977. Make a line graph for the data.

Year	1970	1971	1972	1973	1974	1977
Cases (millions)	106.5	97.7	84.8	96.1	101.5	90.

76) The numbers of students in the College of Arts and Sciences, categorized by major, are listed below. Make a bar graph for the data.

Major	Number of Students
Math	150
History	300
English	350
Science	250
Other	200

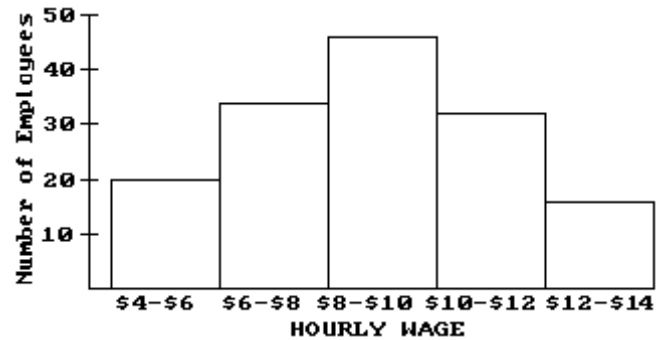


78) The weights (in pounds) of a group of high school students are listed below in a stem-and-leaf plot.

Stem	Leaves
9	8 9
10	1 4 6 7 8
11	0 2 4 4 6 8
12	3 5 8 9
13	0 0 2 4 6 7 8 9
14	1 2 2 2 5 7 8
15	1 6 7 9

What does 12 | 5 represent on the plot?

79) The wages of the employees of a company are presented in this histogram. Assume that \$6 is in the interval \$6-\$8, not \$4-\$6, similarly for \$8, \$10, and \$12.



How many employees earn at least \$4 and less than \$6 an hour?

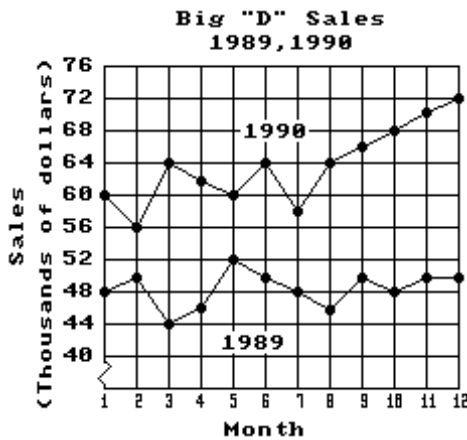
Use the figure to answer the question.

77) Marriage Licenses Issued
(Each circle represents 20,000 licenses)

March	○	∩			
April	○	○			
May	○	○	○	○	
June	○	○	○	○	○
July	○	○	○	∩	
August	○	○	○	○	∩

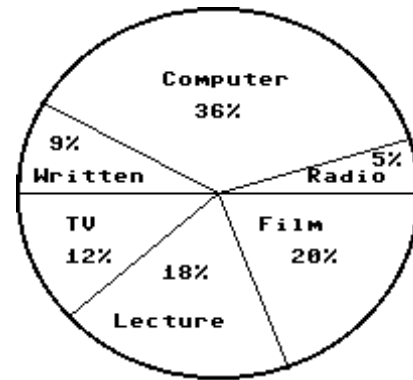
How many licenses are issued in July?

80) The sales figures for the Big "D" Company area shown below in a line plot.



What were the total sales for the first 6 months of 1989?

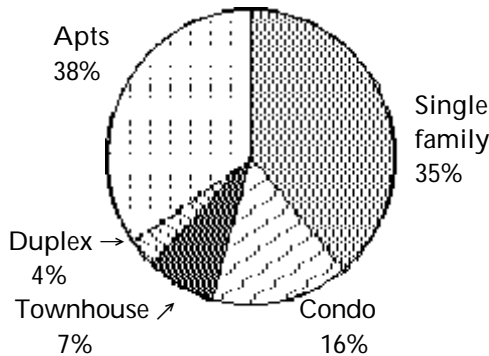
82) In a school survey, students showed these preferences for instructional materials.



About how many students would you expect to prefer films in a school of 900 students?

Use the circle graph to solve the problem.

81) The circle graph shows the percent of the total population of 75,200 of Springfield living in the given types of housing.



Find the number of people who live in duplexes. Round your result to the nearest whole number.

Find the mean, median, and mode. Round to the nearest tenth when necessary.

83) Given these board lengths: 11, 12, 15, 17, 12

84) Given these downtime hours: 13, 1, 7, 9, 10, 13, 7, 13

Solve the problem.

85) The six Cane brothers spent \$57.03, \$69.39, \$64.28, \$76.05, \$46.26, and \$73.38 on groceries. Find the mean grocery bill.

86) The five sales people at Southwest Appliances earned commissions last year of \$16,000, \$33,000, \$45,000, \$18,000, and \$32,000. Find the mean commission.

87) Jim had grades of 88 and 100 on two chemistry tests. What is the lowest score he can get on the third test to obtain an average of 90?

88) Data for the amount of sun-induced expansion (in mm) of a steel I-beam were collected. The measurements are 7.70, 7.73, 7.72, 7.78, and 7.70. Find the standard deviation for the data. Round the results to the nearest thousandth.