Exam 4 will be on 04/19/11 and cover the following sections: 11.2, 11.3, 11.4, 11.5, 11.6, 11.7.

Evaluate the expression.
1) $4^P_0$
2) $9^P_4$
3) $10^P_7$
4) $10^P_6$
5) $5^P_2$
6) $11^P_5$

An order of award presentations has been devised for seven people: Jeff, Karen, Lyle, Maria, Norm, Olivia, and Paul.
7) In how many ways can the people be presented?

Suppose a traveler wanted to visit a museum, an art gallery, and the state capitol building. 45-minute tours are offered at each attraction hourly from 10 a.m. through 3 p.m. (6 different hours). Solve the problem, disregarding travel time.
8) In how many ways can the traveler visit all three places in one day?
9) In how many ways could the traveler schedule two of the three tours in one day?
10) In how many ways could the traveler schedule all three tours before 1 p.m.?

Solve the problem.
11) How many different three-number "combinations" are possible on a combination lock having 22 numbers on its dial? Assume that no numbers repeat. (Combination locks are really permutation locks.)

12) There are 7 horses in a race. In how many ways can the first three positions of the order of the finish occur? (Assume there are no ties.)

13) How many ways can the letters in the word "WISCONSIN" be arranged?

How many distinguishable permutations of letters are possible in the word?
14) CRITICS
15) LOOK
16) GIGGLE
17) TENNESSEE

18) MISSISSIPPI

19) COMMITTEE

Given a group of students: \( G = \{\text{Allen, Brenda, Chad, Dorothy, Eric}\} \) or \( G = \{A, B, C, D, E\} \), count the different ways of choosing the following officers or representatives for student congress. Assume that no one can hold more than one office.

20) Four representatives

21) Three representatives, if two must be female and one must be male

22) A president, a secretary, and a treasurer, if the president must be a woman and the other two must be men

Four accounting majors, two economics majors, and three marketing majors have interviewed for five different positions with a large company. Find the number of different ways that five of these could be hired.

23) Two accounting majors must be hired first, then one economics major, then two marketing majors.

Evaluate the expression.

24) \( 8^C_3 \)

25) \( 10^C_1 \)

26) \( 4^C_1 \)

27) \( 6^C_3 \)

28) \( 6^C_4 \)

29) \( 7^C_4 \)

30) \( 9^C_1 \)

Solve the problem.

31) How many ways can a committee of 3 be selected from a club with 12 members?

32) In how many ways can a student work 8 out of 10 questions on an exam?

33) How many ways can a committee of 6 be selected from a club with 10 members?
34) If the police have 8 suspects, how many different ways can they select 5 for a lineup?

35) In how many ways can a group of 8 students be selected from 9 students?

36) A bag contains 6 apples and 4 oranges. If you select 5 pieces of fruit without looking, how many ways can you get 5 apples?

37) A bag contains 7 apples and 5 oranges. If you select 6 pieces of fruit without looking, how many ways can you get 6 oranges?

38) How many 5-card poker hands consisting of 2 aces and 3 kings are possible with an ordinary 52-card deck?

39) Bob is planning to pack 6 shirts and 4 pairs of pants for a trip. If he has 10 shirts and 9 pairs of pants to choose from, in how many different ways can this be done?

Of the 2,598,960 different five-card hands possible from a deck of 52 playing cards, how many would contain the following cards?

40) All four aces

41) All black cards

42) No face cards

43) All diamonds

Find the number of ways to get the following card combination from a 52-card deck.

44) Two black cards and three red cards

45) No face cards in a five-card hand

46) Two black queens and two red kings

47) One spade, two hearts, and two clubs

A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability.

48) All cherry

49) 2 cherry, 1 lemon

50) All lemon

51) One of each flavor

52) 2 orange, 1 lemon
53) 1 cherry, 2 lemon

Solve.
54) A 6-sided die is rolled. What is the probability of rolling a number less than 3?
55) Two 6-sided dice are rolled. What is the probability the sum of the two numbers on the die will be 5?
56) Two 6-sided dice are rolled. What is the probability that the sum of the two numbers on the dice will be greater than 10?

Find the probability of the given event.
57) A single fair die is rolled. The number on the die is a 3 or a 6.
58) A single fair die is rolled. The number on the die is greater than 2.
59) A single fair die is rolled. The number on the die is not 6.
60) A single fair die is rolled. The number on the die is a multiple of 3.
61) A single fair die is rolled. The number on the die is prime.
62) Two fair dice are rolled. The sum of the numbers on the dice is 4.
63) Two fair dice are rolled. The sum of the numbers on the dice is 6 or 11.
64) Two fair dice are rolled. The sum of the numbers on the dice is greater than 9.

Find the probability.
65) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting a seven.
66) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting a red 7.
67) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting a club.
68) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting the 3 of clubs.
69) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting a black 4 or a black 5.
70) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing an ace or a 9?
71) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a face card or a 4?

72) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a heart, club, or diamond?

73) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a black card that is not a face card?

74) A bag contains 8 red marbles, 2 blue marbles, and 6 green marbles. What is the probability that a randomly selected marble is blue?

75) A lottery game has balls numbered 1 through 19. What is the probability that a randomly selected ball is an even numbered ball or a 8?

76) A bag contains 6 red marbles, 2 blue marbles, and 1 green marble. What is the probability that a randomly selected marble is not blue?

Find the probability of the following card hands from a 52-card deck. In poker, aces are either high or low. A bridge hand is made up of 13 cards.

77) In bridge, exactly 3 kings and exactly 3 queens

78) In bridge, 4 aces

79) In bridge, all cards in one suit

Find the odds.

80) \[ \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \]

What are the odds of drawing a 2 from these cards?

81) \[ \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \]

What are the odds of drawing an even number from these cards?

82) \[ \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \]

What are the odds of drawing a number greater than 2 from these cards?

83) A number cube labeled with numbers 1, 2, 3, 4, 5, and 6 is tossed. What are the odds for the cube showing an odd number?

84) A number cube labeled with numbers 1, 2, 3, 4, 5, and 6 is tossed. What are the odds for the cube showing a 4?

85) A number cube labeled with numbers 1, 2, 3, 4, 5, and 6 is tossed. What are the odds for the cube showing a number less than 3?
86) The kings are separated from a deck of standard playing cards and shuffled. One is randomly selected. What are the odds in favor of drawing a black card?

87) Seven slips of paper marked with the numbers 1, 2, 3, 4, 5, 6, and 7 are placed in a box and mixed well. Two are drawn. What are the odds that the sum of the numbers on the two selected slips is not 6?

Solve the problem.

88) The odds in favor of a horse winning a race are posted as 8 : 5. Find the probability that the horse will win the race.

89) The odds in favor of a horse winning a race are posted as 4 : 3. Find the probability that the horse will lose the race.

90) The odds in favor of Carl beating his friend in a round of golf are 4 : 3. Find the probability that Carl will beat his friend.

91) The odds in favor of Carl beating his friend in a round of golf are 9 : 7. Find the probability that Carl will lose.

92) The odds against Carl beating his friend in a round of golf are 8 : 5. Find the probability that Carl will beat his friend.

93) The odds against Carl beating his friend in a round of golf are 5 : 2. Find the probability that Carl will lose.

94) The odds in favor of Jerome beating his friend in a round of golf are 1 : 7. Find the probability that Jerome will beat his friend.

95) The odds in favor of Trudy beating her friend in a round of golf are 1 : 9. Find the probability that Trudy will lose.

96) The odds against Chip beating his friend in a round of golf are 1 : 8. Find the probability that Chip will beat his friend.

97) The odds against Muffy beating her friend in a round of golf are 1 : 8. Find the probability that Muffy will lose.

98) If two cards are drawn without replacement from a deck, find the probability that the second card is a spade, given that the first card was a spade.

99) If two cards are drawn without replacement from a deck, find the probability that the second card is red, given that the first card was a heart.

100) If two cards are drawn without replacement from a deck, find the probability that the second card is a face card, given that the first card was a queen.

101) If two cards are drawn without replacement from a deck, find the probability that the second card is an ace, given that the first card was an ace.
102) If three cards are drawn without replacement from a deck, find the probability that the third card is a heart, given that the first two cards were hearts.

103) If three cards are drawn without replacement from a deck, find the probability that the third card is a face card, given that the first card was a queen and the second card was a 5.

Two marbles are drawn without replacement from a box with 3 white, 2 green, 2 red, and 1 blue marble. Find the probability.

104) The second marble is red given the first marble is white.

105) The second marble is white given the first marble is blue.

106) The second marble is blue given the first marble is white.

107) The second marble is blue given the first marble is red.

108) The second marble is blue given the first marble is blue.
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Answer Key
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52) .0364
53) .0364
54) $\frac{1}{3}$
55) $\frac{1}{9}$
56) $\frac{1}{12}$
57) $\frac{1}{3}$
58) $\frac{2}{3}$
59) $\frac{5}{6}$
60) $\frac{1}{3}$
61) $\frac{1}{2}$
62) $\frac{1}{12}$
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64) $\frac{1}{6}$
65) $\frac{1}{13}$
66) $\frac{1}{26}$
67) $\frac{1}{4}$
68) $\frac{1}{52}$
69) $\frac{1}{13}$
70) $\frac{2}{13}$
71) $\frac{4}{13}$
72) $\frac{3}{4}$
73) $\frac{5}{13}$
74) $\frac{1}{8}$
75) $\frac{9}{19}$
Answer Key
Testname: MGF_1106_SPRING_11_EXAM_4_REVIEW

76) $\frac{7}{9}$
77) 0.00097
78) 0.00264
79) $6.30 \times 10^{-12}$
80) 1:4
81) 2:3
82) 3:2
83) 1:1
84) 1:5
85) 1:2
86) 1 to 1
87) 19 to 2
88) $\frac{8}{13}$
89) $\frac{3}{7}$
90) $\frac{4}{7}$
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99) $\frac{25}{51}$
100) $\frac{11}{51}$
101) $\frac{1}{17}$
102) $\frac{11}{50}$
103) $\frac{11}{50}$
Answer Key
Testname: MGF_1106_SPRING_11_EXAM_4_REVIEW

104) \( \frac{2}{7} \)
105) \( \frac{3}{7} \)
106) \( \frac{1}{7} \)
107) \( \frac{1}{7} \)
108) 0