Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Provide an appropriate response.

1) According to the Center for Disease Control, in 2004, 65.7% of all adults between the ages of 18 and 44 were considered current drinkers. Based on this estimate, if two randomly selected adults between the ages of 18 and 44 are selected, what is the probability that at least one is a current drinker?

1) _____

  A) 0.88
  B) cannot be determined from the information givena
  C) 1
  D) 0.43
  E) 0.57

2) A sample of two light bulbs is selected in succession, without replacement, from among 6 good ones and 4 defective ones. What is the complement of the event "at least one light bulb is defective"?

2) _____

  A) both bulbs are defective
  B) at least one bulb is not defective
  C) neither bulb is defective

List the outcomes comprising the specified event.

3) In a competition, two people will be selected from four finalists to receive the first and second prizes. The prize winners will be selected by drawing names from a hat. The names of the four finalists are Jim, George, Helen, and Maggie. The possible outcomes can be represented as follows.

3) _____

JG   JH JM GJ   GH GM
HJ   HG HM MJ   MG MH

Here, for example, JG represents the outcome that Jim receives the first prize and George receives the second prize. List the outcomes that comprise the event that Helen gets a prize.

  A) HJ, HG, HM
  B) JH, GH, HJ, HG, HM, MH
  C) JH, GH, HJ
  D) JH, GH, HJ, JG, HG, HM, MH
  E) JH, GH, HJ, HG, HM

Determine whether the events are disjoint.

4) When a quarter is tossed four times, 16 outcomes are possible.

HHHH   HHHT   HHTH   HHTT
HTHH   HTHT   HTTH   HTTT
THHH   THHT   THTH   THTT
TTHH   TTHT   TTTH   TTTT

Here, for example, HTTH represents the outcome that the first toss is heads, the next two tosses are tails, and the fourth toss is heads. The events A and B are defined as follows.

A = event the first two tosses are heads
B = event the first and last tosses are the same

Are the events A and B disjoint?
  A) Yes   B) No

Find the indicated probability.

5) If two balanced die are rolled, the possible outcomes can be represented as follows.

(1, 1) (2, 1) (3, 1) (4, 1) (5, 1) (6, 1)
(1, 2) (2, 2) (3, 2) (4, 2) (5, 2) (6, 2)
(1, 3) (2, 3) (3, 3) (4, 3) (5, 3) (6, 3)
(1, 4) (2, 4) (3, 4) (4, 4) (5, 4) (6, 4)
(1, 5) (2, 5) (3, 5) (4, 5) (5, 5) (6, 5)
(1, 6) (2, 6) (3, 6) (4, 6) (5, 6) (6, 6)

Determine the probability that the sum of the dice is 7.
  A) $\dfrac{5}{36}$ B) $\dfrac{1}{6}$ C) $\dfrac{7}{36}$ D) $\dfrac{7}{18}$ E) $\dfrac{2}{9}$

Find the probability using complements.

6) A percentage distribution is given below for the size of families in one U.S. city.

Size	Percentage
2	45.1
3	22.2
4	19.7
5	8.0
6	3.1
7+	1.9

A family is selected at random. Find the probability that the size of the family is less than 6. Round your result to three decimal places.
  A) 0.981   B) 0.050   C) 0.950   D) 0.019   E) 0.031

Find the indicated probability.

7) In 2006, 88.2% of respondents to the General Social Survey answered "yes" when asked if it should   7) _____
be possible for a pregnant woman to obtain a legal abortion if the woman's own health was
seriously endangered by the pregnancy and 91.4% answered "yes" when asked whether they were
in favor of sex education in public schools. If 82.6% of the respondents answered "yes" to both
questions, what is the probability that a randomly selected respondent answered "yes" to at least
one of the questions?

    A) 0.914   B) 0.97   C) 1   D) 0.794   E) 0.858

8) In 2006, the General Social Survey asked 1,963 respondents whether they favored or opposed a gun   8) _____
law requiring people to have a permit in order to purchase a gun. The responses, categorized by
gender, are given in the table below.

Gun Law	Sex		Total
	Male	Female	
Favor	610	958	1,568
Oppose	238	157	395
Total	848	1,115	1,963

Given that a respondent favors the gun law, what is the probability that they are female?

    A) 0.88   B) 0.86   C) 0.45   D) 0.49   E) 0.61

Determine the possible values of the random variable.

9) Suppose that two balanced dice, a red die and a green die, are rolled. Let Y denote the value of   9) _____
G minus R where G represents the number on the green die and R represents the number on the
red die. What are the possible values of the random variable Y?

    A) -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6   B) 0, 1, 2, 3, 4, 5

    C) -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5   D) 0, 1, 2, 3, 4, 5, 6

Find the mean of the given probability distribution.

10) The random variable X is the number of houses sold by a realtor in a single month at a particular   10) _____
real estate office. Its probability distribution is given in the table below.

x	P(X = x)
0	0.24
1	0.01
2	0.12
3	0.16
4	0.01
5	0.14
6	0.11
7	0.21

    A) 3.60   B) 3.40   C) 3.35   D) 3.50

Use a table of areas to find the specified area under the standard normal curve.

11) The area that lies to the left of 1.13   11) _____

    A) 0.8485   B) 0.8907   C) 0.1292   D) 0.8708   E) 0.4354

Use a table of areas for the standard normal curve to find the required z-score.

12) Find the z-score having area 0.09 to its left under the standard normal curve.   12) _____

    A) -1.45   B) -1.34   C) 1.34   D) -1.39   E) -1.26

Find the indicated probability for the normally distributed variable.

13) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz?

    A) 0.4013   B) 0.8026   C) 0.3821   D) 0.0987   E) 0.5987

13) _____

14) The lengths of human pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days. What is the probability that a pregnancy lasts at least 300 days?

    A) 0.4834   B) 0.0179   C) 0.0166   D) 0.0332   E) 0.9834

14) _____

Determine whether a probability model based on Bernoulli trials can be used to investigate the situation. If not, explain.

15) We draw a card from a deck 6 times (replacing the card after each draw). Can the binomial distribution be used to model the number of kings drawn?

    A) No. More than two outcomes are possible.
    B) No. The probability of getting a king changes as cards are drawn.
    C) No. The draws are not independent of each other.
    D) Yes.
    E) No. 6 is more than 10% of 52

15) _____

Find the mean of the binomial random variable.

16) A die is rolled 10 times and the number of times that two shows on the up face is counted. If this experiment is repeated many times, find the mean for the random variable X, the number of twos thrown out of ten tosses.

    A) 2.98   B) 2.5   C) 3.33   D) 8.33   E) 1.67

16) _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Find the indicated probability for the normally distributed variable.

17) In 2005, the property crime rates (per 100,000 residents) for the 50 states and the District of Columbia had a mean of 3377.2 and a standard deviation of 847.4 (*Statistical Abstract of the United States*). Assuming the distribution of property crime rates is normal, what percentage of the states had property crime rates between 2360 and 4055?

a) Draw the normal distribution curve and mark the mean and observations of interest.

b) Find the z-scores.

c) Find the corresponding cumulative precentages.

d) Find the precentage between 2360 and 4055.