MGF 1106 Math for Liberal Arts I Summer 2008 - Practice Final Exam
Dr. Schnackenberg

If you do not agree with the given answers, answer "E" for "None of the above".

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

Find the mode for the group of data items.If there is no mode, so state.

1) 98, 98, 91, 39, 77, 98 1) _____

A) 39 B) 98 C) no mode D) 91

Suppose that prices of a certain model of new homes are normally distributed with a mean of $150,000. Use the 68-95-99.7 rule to find the percentage of buyers who paid:

2) more than $155,000 if the standard deviation is $2500. 2) _____

A) 95% B) 97.5% C) 47.5% D) 2.5%

The chart shows the probability of dying from four conditions in the U.S. Express all probabilities as decimals to three decimal places. Assume all events are mutually exclusive.

Causes of Death	Percentage of all Deaths
Disease A	30.3%
Disease B	23.0%
Disease C	5.8%
Disease D	4.7%

3) What is the probability of dying from disease A or B? 3) _____

A) 0.230 B) 0.697 C) 0.303 D) 0.533

Find the standard deviation for the group of data items.

4) 11, 18, 11, 18, 11, 18, 11, 18 4) _____

A) $\frac{49}{4}$ B) 49 C) $\frac{7}{2\sqrt{7}}$ D) $\frac{7\sqrt{2}}{\sqrt{7}}$

Evaluate the factorial expression.

5) $(\frac{6}{2})!$ 5) _____

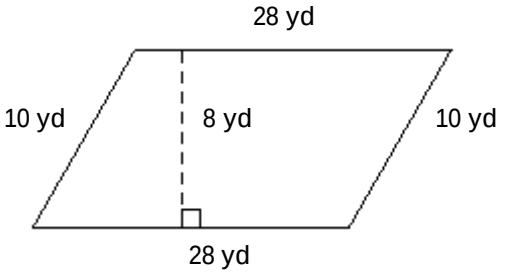
A) 2 B) 6 C) 12 D) 360

Find the range for the group of data items.

6) 5, 5, 5, 19, 29, 29, 29 6) _____

A) 19 B) 34 C) 14 D) 24

Use formulas to find the area of the figure.

7) 

7) _____

A) 2240 sq. yd B) 224 sq. yd C) 280 sq. yd D) 38 sq. yd

Write the negation of the quantified statement. (The negation should begin with "all," "some," or "no.")

8) All athletes are famous. 8) _____

A) All athletes are not famous. B) All athletes are somewhat famous.

C) Some athletes are famous. D) Some athletes are not famous.

Use the table of z-scores and percentiles to find the percentage of data items in a normal distribution that lie a. above and b. below the given score.

9) z = -0.2 9) _____

A) 42.07%, 57.93% B) 0%, 100% C) 57.93%, 42.07% D) 42.07%, 42.07%

Solve the problem that involves probabilities with events that are not mutually exclusive.

10) The physics department of a college has 9 male professors, 7 female professors, 13 male teaching assistants, and 11 female teaching assistants. If a person is selected at random from the group, find the probability that the selected person is a teaching assistant or a female. 10) _____

A) $\frac{1}{2}$ B) $\frac{31}{40}$ C) $\frac{9}{20}$ D) $\frac{3}{5}$

11) Consider a political discussion group consisting of 7 Democrats, 3 Republicans, and 9 Independents. Suppose that two group members are randomly selected, in succession, to attend a political convention. Find the probability of selecting an Independent and then a Democrat. 11) _____

A) $\frac{1}{38}$ B) $\frac{7}{342}$ C) $\frac{63}{361}$ D) $\frac{7}{38}$

Solve the problem.

12) A garden is in the shape of a rectangle 40 feet long and 23 feet wide. If fencing costs $8 a foot, what will it cost to place fencing around the garden? 12) _____

A) $7360 B) $504 C) $1008 D) $2016

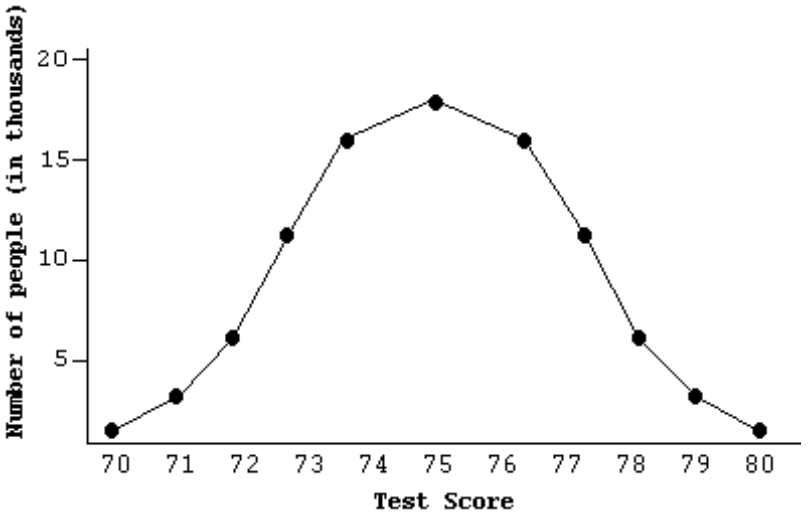
13) If you are dealt 5 cards from a shuffled deck of 52 cards, find the probability that all 5 cards are picture cards. 13) _____

A) $\frac{33}{108290}$ B) $\frac{3}{13}$ C) $\frac{1}{216580}$ D) $\frac{1}{2598960}$

14) The winner of a raffle will receive a new car. If 10,000 raffle tickets were sold and you purchased 30 tickets, what are the odds against your winning the car? 14) _____

A) 10000 to 30 B) 9970 to 30 C) 30 to 10000 D) 30 to 9970

15) The frequency polygon below shows a distribution of test scores. 15) _____



Which one of the following is true based on the graph?

A) The percent of scores above any given score is equal to the percent of scores below that score.

B) More people had a score of 75 than any other, and as the deviation from 75 increases or decreases, the scores fall off in a symmetrical manner.

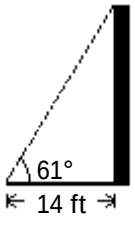
C) The graph is based on a sample of approximately 15 thousand people.

D) More people had a score of 77 than a score of 73.

16) A 25 year old can purchase a one-year life insurance policy for $10,000 at a cost of $100. Past history indicates that the probability of a person dying at age 25 is 0.0024. Determine the company's expected gain per policy. 16) _____

A) 124 B) 976 C) 76 D) 24

17) At a certain time of day, the angle of elevation of the sun is 61°. To the nearest foot, find the height of a pole whose shadow at that time is 14 feet long. 17) _____



A) 28 feet B) 27 feet C) 7 feet D) 25 feet

18) Find the sum of the measures of the angles of a hexagon. 18) _____

A) 720° B) 1080° C) 180° D) 540°

Solve the problem that involves computing expected values in a game of chance.

19) A numbers game run by many state governments allows a player to select a three-digit number from 000 to 999. There are 1000 such numbers. A bet of $9 is placed on a number. If the number is selected, the player wins $900. If any other number is selected, the player wins nothing. Find the expected value for the game. 19) _____

A) $8.10 B) -$8.10 C) $9.00 D) -$9.00

The table shows the number of minority officers in the U.S. military in 2000.

	Army	Navy	Marines	Air Force
African Americans	9162	3524	1341	4282
Hispanic Americans	2105	2732	914	1518
Other Minorities	4075	2653	599	3823

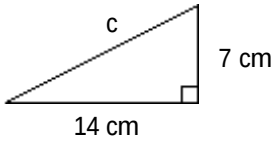
Assume that one person will be randomly selected from the group described in the table.

20) Find the probability of selecting an officer who is in the Navy, given that the officer is African American. 20) _____

A) $\frac{3542}{14785}$ B) $\frac{8909}{18,309}$ C) $\frac{3524}{8909}$ D) $\frac{3524}{18,309}$

Use the Pythagorean Theorem to find the missing length in the right triangle. Use a calculator to find square roots, rounding, if necessary, to the nearest tenth.

21) 21) _____



A) 245 cm B) 122.5 cm C) 10.5 cm D) 15.7 cm

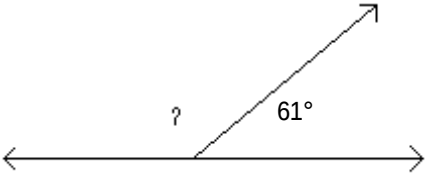
Find the midrange for the group of data items.

22) 100, 100, 94, 30, 77, 100 22) _____

A) 88.5 B) 97 C) 65 D) 62

Find the measure of the angle in which ?° appears.

23) 23) _____



A) 151° B) 29° C) 39° D) 119°

Solve the problem by applying the Fundamental Counting Principle with two groups of items.

24) In how many ways can a girl choose a two-piece outfit from 7 blouses and 4 skirts? 24) _____

A) 28 B) 11 C) 13 D) 56

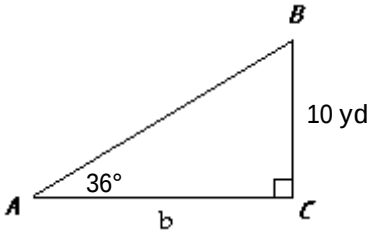
Find the median for the group of data items.

25) 1.3, 2.3, 1.6, 2.7, 1.3, 2.3, 1.3, 9.3, 9.3, 1.8 25) _____

A) 2.3 B) 2.05 C) 1.8 D) 1.3

Find the measure of the side of the right triangle whose length is designated by the lowercase letter. Round your answer to the nearest whole number.

26) 26) _____



A) 14 yd B) 1 yd C) 11 yd D) 16 yd

Use $\subseteq$, $\not\subseteq$, $\subset$, or both $\subset$ and $\subseteq$ to make a true statement.

27) {11, 12, 13} __ {11, 12, 13} 27) _____

A) $\not\subseteq$ B) $\subseteq$ C) $\subset$ D) $\subset$ and $\not\subseteq$

The scores on a driver's test are normally distributed with a mean of 100. Find the score that is:

28) Find the score that is 2 standard deviations below the mean, if the standard deviation is 13. 28) _____

A) 126 B) 113 C) 87 D) 74

A set of data items is normally distributed with a mean of 500. Find the data item in this distribution that corresponds to the given z-score.

29) z = 1.5, if the standard deviation is 20. 29) _____

A) 600 B) 510 C) 530 D) 520

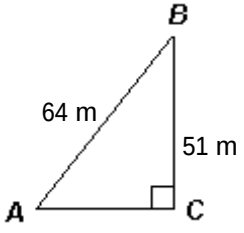
Use the formula for ${}_nC_r$ to evaluate the expression.

30) A physics exam consists of 9 multiple-choice questions and 6 open-ended problems in which all work must be shown. If an examinee must answer 7 of the multiple-choice questions and 2 of the open-ended problems, in how many ways can the questions and problems be chosen? 30) _____

A) 261,273,600 B) 540 C) 756 D) 5,443,200

Use the inverse trigonometric keys on a calculator to find the measure of angle A, rounded to the nearest whole degree.

31) 31) _____



A) 53° B) 56° C) 54° D) 55°

Find the mean for the group of data items. Round to the nearest hundredth, if necessary.

32) 8, 3.4, 4.8, 7.4, 8, 7, 8, 7.7, 7.7, 3.5 32) _____

A) 6.55 B) 4.95 C) 5.78 D) 7.28

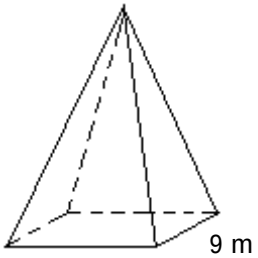
You are dealt one card from a 52-card deck. Find the probability that you are not dealt:

33) a diamond. 33) _____

A) $\frac{2}{5}$ B) $\frac{3}{4}$ C) $\frac{4}{13}$ D) $\frac{1}{4}$

Find the volume of the figure. If necessary, round the answer to the nearest whole number.

34) 11 m 34) _____



A) 1881 m^3 B) 1969 m^3 C) 627 m^3 D) 107,217 m^3

Given that p and q each represents a simple statement, write the indicated symbolic statement in words.

35) p: The car has been repaired. 35) _____
q: The kids are home.
r: We will visit Aunt Tillie.
$\sim r \rightarrow (\sim p \vee \sim q)$

A) If we will not visit Aunt Tillie, then the car has not been repaired or the kids are not home.

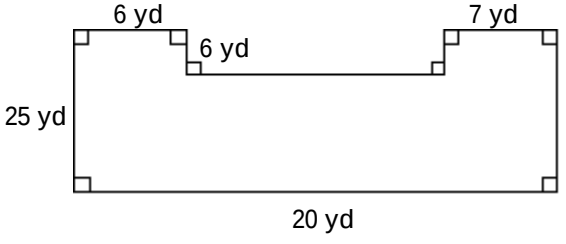
B) If we will not visit Aunt Tillie, then the car has not been repaired and the kids are not home.

C) If we visit Aunt Tillie, then the car has been repaired or the kids are home.

D) We will not visit Aunt Tillie if and only if the car has not been repaired or the kids are not home.

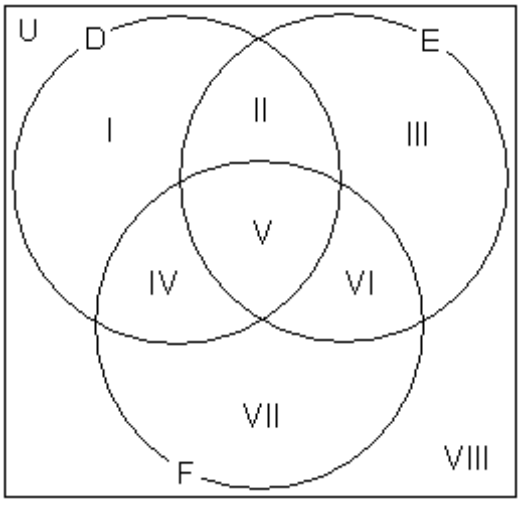
Find the perimeter of the figure shown. Express the perimeter in the same unit of measure that appears on the given side or sides.

36) 36) _____



A) 96 yd B) 115 yd C) 77 yd D) 102 yd

Use the Venn diagram shown to answer the question.



37) Which regions represent set E'? 37) _____

A) VIII B) II, V, VI C) I, IV, VII, VIII D) II, III, V, VI

Write the equivalent contrapositive of the statement.

38) If he is not working in Sweden, then he is vacationing in Belgium. 38) _____

A) If he is working in Sweden, then he is not vacationing in Belgium.

B) If he is not vacationing in Sweden, then he is working in Belgium.

C) If he is vacationing in Sweden, then he is not working in Belgium.

D) If he is not vacationing in Belgium, then he is working in Sweden.

Use a truth table to determine whether the symbolic form of the argument is valid or invalid.

39) $q \rightarrow p$ 39) _____
$p \rightarrow r$
———
$\therefore r \rightarrow q$

A)

p	q	r	$q \rightarrow p$	$p \rightarrow r$	$(q \rightarrow p) \wedge (p \rightarrow r)$	$r \rightarrow q$	$[(q \rightarrow p) \wedge (p \rightarrow r)] \wedge (r \rightarrow q)$
T	T	T	T	T	T	T	T
T	T	F	T	F	F	T	F
T	F	T	T	T	T	F	F
T	F	F	T	F	F	T	F
F	T	T	F	T	F	T	F
F	T	F	F	T	F	T	F
F	F	T	T	T	T	F	F
F	F	F	T	T	T	T	T

Symbolic argument is invalid.

B)

p	q	r	$q \to p$	$p \to r$	$(q \to p) \wedge (p \to r)$	$r \to q$	$[(q \to p) \wedge (p \to r)] \to (r \to q)$
T	T	T	T	T	T	T	T
T	T	F	T	F	F	T	T
T	F	T	T	T	F	T	T
T	F	F	T	F	F	T	T
F	T	T	F	T	F	T	T
F	T	F	F	T	F	T	T
F	F	T	T	T	F	T	T
F	F	F	T	T	T	T	T

Symbolic argument is valid.

C)

p	q	r	$q \to p$	$p \to r$	$(q \to p) \wedge (p \to r)$	$r \to q$	$[(q \to p) \wedge (p \to r)] \to (r \to q)$
T	T	T	T	T	T	T	T
T	T	F	T	F	F	T	T
T	F	T	T	T	F	T	T
T	F	F	T	F	F	T	T
F	T	T	F	T	F	T	T
F	T	F	F	T	F	T	T
F	F	T	T	T	F	T	T
F	F	F	T	T	F	T	T

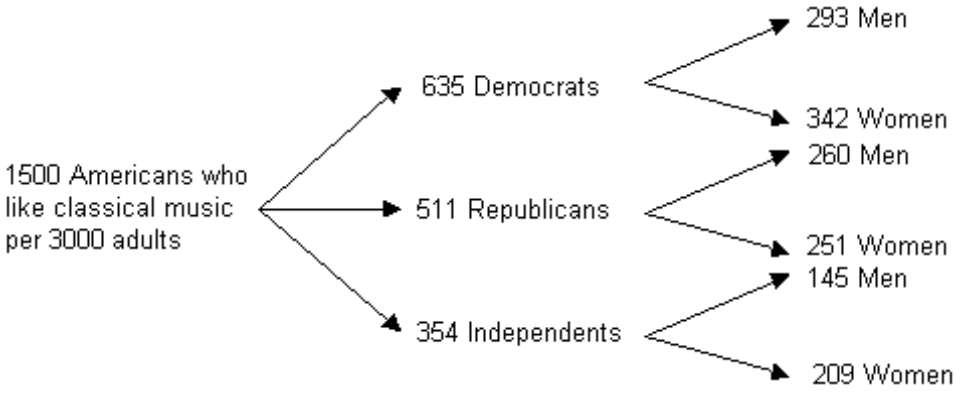
Symbolic argument is valid.

D)

p	q	r	$q \to p$	$p \to r$	$(q \to p) \wedge (p \to r)$	$r \to q$	$[(q \to p) \wedge (p \to r)] \to (r \to q)$
T	T	T	T	T	T	T	T
T	T	F	T	F	F	T	T
T	F	T	T	T	T	F	F
T	F	F	T	F	F	T	T
F	T	T	F	T	F	T	T
F	T	F	F	T	F	T	T
F	F	T	T	T	T	F	F
F	F	F	T	T	T	T	T

Symbolic argument is invalid.

Consider below the branching tree diagram based on the number per 3000 American adults.



Let T = the set of Americans who like classical music
R = the set of Republicans who like classical music
D = the set of Democrats who like classical music
I = the set of Independents who like classical music

Determine whether the statement is true or false.

40) Let M = the set of Republican men who like classical music
W = the set of Republican women who like classical music
If $x \in R$, then $x \in M$. 40) _____

A) True B) False