

Name _____

INSTRUCTIONS: Turn off and stow all cell phones and pagers. Calculators may be used, but cell phone may not be used as calculators.

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

Determine the most probable next term in the sequence.

1) 486, 162, 54, 18, 6

A) 1

B) 2

C) 3

D) $\frac{2}{3}$

1) _____

Use the method of Gauss to find the sum.

2) $1 + 2 + 3 + \dots + 875$

A) 191,406.25

B) 382,812.5

C) 383,250

D) 767,376

2) _____

Use the method of successive differences to determine the next term in the sequence.

3) 14, 20, 31, 47, 68, ...

A) 89

B) 98

C) 99

D) 94

3) _____

Use problem solving strategies to solve the problem.

4) I'm thinking of a number between 4 and 10. If I square my number and find the difference of the digits, I will end up with the cube root of my number. What is my number?

A) 8

B) 6

C) 4

D) 13

4) _____

Solve the problem.

5) If you raise 9 to the 387th power, what is the units digit of the result?

A) 6

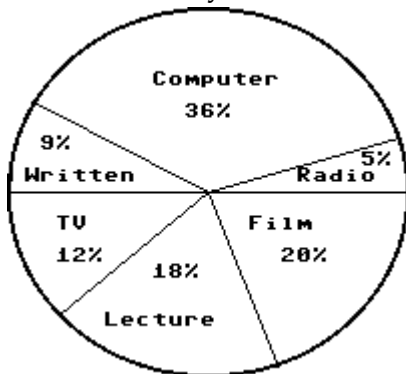
B) 9

C) 1

D) 7

5) _____

In a school survey, students showed these preferences for instructional materials. Answer the question.



6) About how many students would you expect to prefer computers in a school of 650 students?

A) About 130 students

B) About 36 students

C) About 117 students

D) About 234 students

6) _____

Complete the magic (addition) square. A magic square has the property that the sum of the numbers in any row, column, or diagonal is the same.

7) Use each number 3, 4, 5, 6, 7, 8, 9, 10, and 11 once.

7) _____

6		
5	7	
10	3	8

A)

6	11	4
5	7	9
10	3	8

B)

6	9	11
5	7	4
10	3	8

C)

6	11	9
5	7	4
10	3	8

D)

6	9	4
5	7	11
10	3	8

Write the set in set-builder notation.

8) {2, 4, 6, 8}

8) _____

- A) {x | x is any even natural number}
- B) {x | x is an even natural number less than 10}
- C) {x | x is any even integer less than 10}
- D) {2, 4, 6, 8}

Find $n(A)$ for the set.

9) $A = \{x \mid x \text{ is a month in the year}\}$

9) _____

- A) $n(A) = 12$
- B) $n(A) = 52$
- C) $n(A) = 1$
- D) $n(A) = 24$

Decide whether \subseteq , \subset , both, or neither can be placed in the blank to make a true statement.

10) {11, 12, 13} ___ {10, 11, 12, 13}

10) _____

- A) \subset
- B) Neither
- C) \subseteq
- D) Both \subset and \subseteq

Find the number of subsets of the set.

11) {6, 7, 8}

11) _____

- A) 6
- B) 7
- C) 8
- D) 3

Find the number of proper subsets of the set.

12) {3, 4, 5}

12) _____

- A) 2
- B) 7
- C) 6
- D) 5

Let $U = \{1, 2, 4, 5, a, b, c, d, e\}$. Find the complement of the set.

13) $Q = \{2, 4, b, d\}$

13) _____

- A) {1, 3, 5, a, c, e}
- B) {1, 5, a, c, e}
- C) {1, 5, a, e}
- D) {1, 2, 4, 5, a, b, c, d, e}

List the elements in the set.

Let $U = \{q, r, s, t, u, v, w, x, y, z\}$

$A = \{q, s, u, w, y\}$

$B = \{q, s, y, z\}$

$C = \{v, w, x, y, z\}$.

14) $(A \cap B)'$

14) _____

- A) {q, s, t, u, v, w, x, y}
- B) {s, u, w}
- C) {r, t, u, v, w, x, z}
- D) {t, v, x}

15) $C' \cup A'$ 15) _____
A) {q, r, s, t, u, v, x, z} B) {w, y}
C) {s, t} D) {q, s, u, v, w, x, y, z}

16) $(A' \cup C) \cap B'$ 16) _____
A) {v, x} B) {r, t, v, w, x}
C) {r, t, u, v, w, s, y, z} D) {y, z}

Find the Cartesian product.

17) $A = \{12, 9, 10\}$ 17) _____
 $B = \{14, 4\}$
Find $A \times B$.
A) {(12, 14), (9, 10), (10, 14)}
B) {(12, 14), (9, 4)}
C) {(14, 12), (14, 9), (14, 10), (4, 12), (4, 9), (4, 10)}
D) {(12, 14), (12, 4), (9, 14), (9, 4), (10, 14), (10, 4)}

Find the indicated cardinal number.

18) Find $n(A \times B)$ given that $A = \{2\}$ and $B = \{1, 3\}$. 18) _____
A) 2 B) 1 C) 4 D) 3

For the given sets, construct a Venn diagram and place the elements in the proper region.

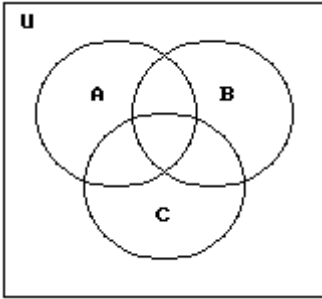
19) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$

$A = \{3, 6, 8\}$

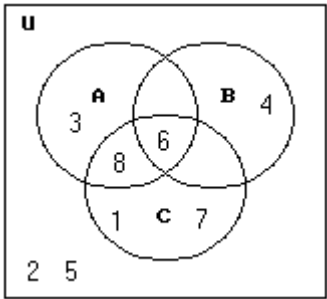
$B = \{4, 6\}$

$C = \{1, 6, 7, 8\}$

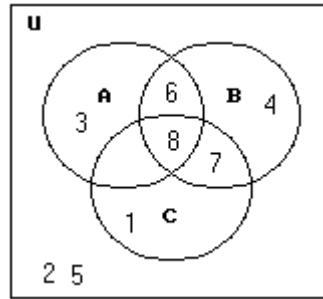
19) _____



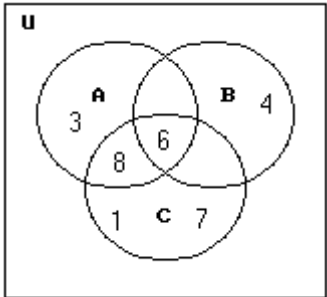
A)



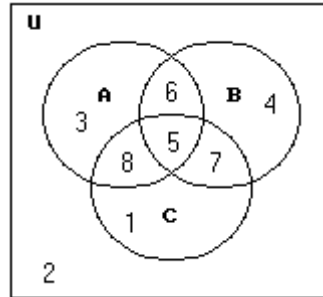
B)



C)



D)



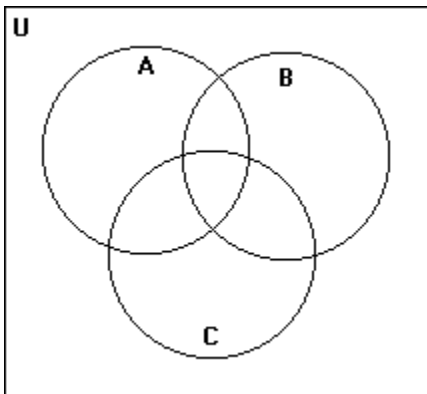
20) $U = \{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p\}$

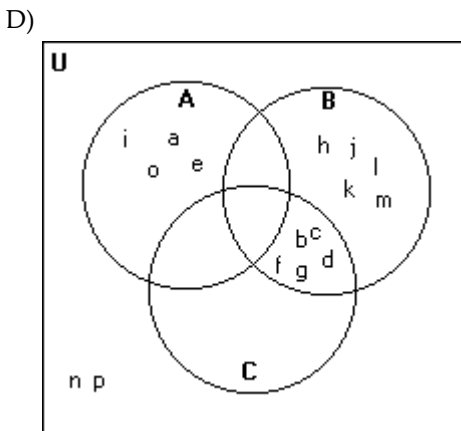
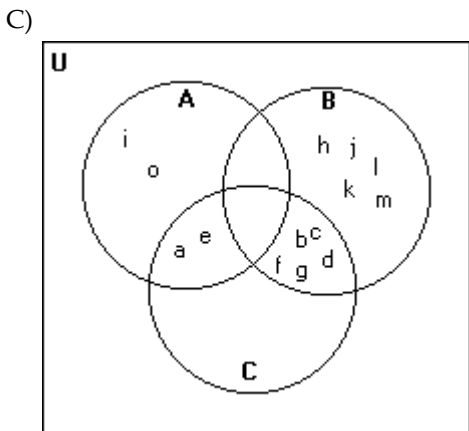
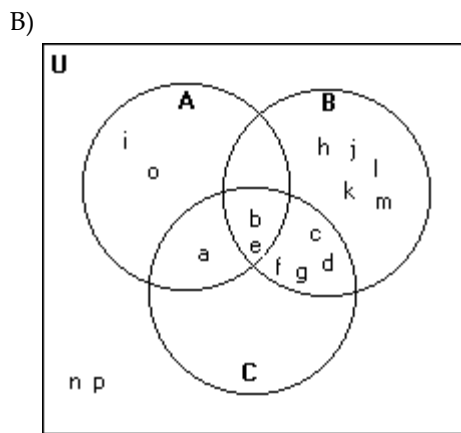
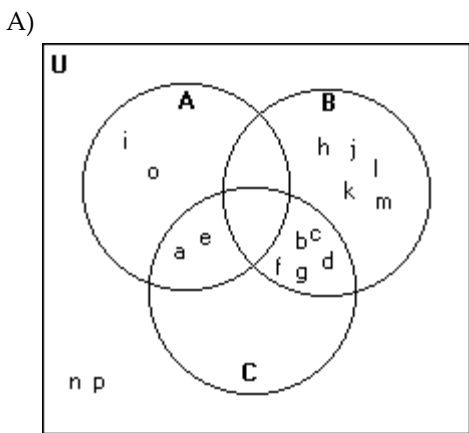
$A = \{a, e, i, o\}$

$B = \{b, c, d, f, g, h, j, k, l, m\}$

$C = \{a, b, c, d, e, f, g\}$

20) _____





Show that the set is infinite by placing it in a one-to-one correspondence with a proper subset of itself. Be sure to show the pairing of the general terms in the sets.

21) $\{5, 6, 7, 8, \dots\}$

A) $\{5, 6, 7, 8, \dots, n+4, \dots\}$

↓ ↓ ↓ ↓ ↓

$\{4, 5, 6, 7, \dots, n+3, \dots\}$

C) $\{5, 6, 7, 8, \dots, n+4, \dots\}$

↓ ↓ ↓ ↓ ↓

$\{6, 7, 8, 9, \dots, n+6, \dots\}$

B) $\{5, 6, 7, 8, \dots, n+4, \dots\}$

↓ ↓ ↓ ↓ ↓

$\{6, 7, 8, 9, \dots, n+5, \dots\}$

D) $\{5, 6, 7, 8, \dots, n+5, \dots\}$

↓ ↓ ↓ ↓ ↓

$\{4, 5, 6, 7, \dots, n+3, \dots\}$

21) _____

Let p represent a true statement, while q and r represent false statements. Find the truth value of the compound statement.

22) $\sim p \vee (q \wedge \sim r)$

A) False

B) True

22) _____

Let p represent $7 < 8$, q represent $2 < 5 < 6$, and r represent $3 < 2$. Decide whether the statement is true or false.

23) $(\sim p \wedge q) \vee \sim r$

A) True

B) False

23) _____

Construct a truth table for the statement.

24) $\sim r \wedge \sim s$

24) _____

A) $r \quad s \quad (\sim r \wedge \sim s)$

T	T	F
T	F	T
F	T	T
F	F	T

B) $r \quad s \quad (\sim r \wedge \sim s)$

T	T	T
T	F	F
F	T	F
F	F	T

C) $r \quad s \quad (\sim r \wedge \sim s)$

T	T	F
T	F	F
F	T	F
F	F	T

D) $r \quad s \quad (\sim r \wedge \sim s)$

T	T	F
T	F	F
F	T	F
F	F	F

Use De Morgan's laws to write the negation of the statement.

25) A day late and a dollar short.

25) _____

A) A day late or not a dollar short.

B) Not a day late and not a dollar short.

C) Not a day late and a dollar short.

D) Not a day late or not a dollar short.

Solve the problem.

26) Given that $p \vee q$ is false, what can you conclude about the truth values of p and q ?

26) _____

A) Exactly one of p and q is false

B) At least one of p and q is false

C) Both p and q are false

D) p and q have the same truth value

Write the converse, inverse, or contrapositive of the statement as requested.

27) If I pass, I'll party.

27) _____

Contrapositive

A) I'll party if I pass.

B) If I don't pass, I won't party.

C) If I party, then I passed.

D) If I don't party, I didn't pass.

Use an Euler diagram to determine whether the argument is valid or invalid.

28) Not all that glitters is gold.

28) _____

My ring glitters.

My ring is not gold.

A) Valid

B) Invalid

The argument has a true conclusion. Identify the argument as valid or invalid.

29) Eric is older than Camille.

29) _____

Camille is older than Todd.

Todd is younger than Eric.

A) Valid

B) Invalid

Determine if the argument is valid or a fallacy. Give a reason to justify answer.

30) If I'm hungry, then I will eat.

30) _____

I'm not hungry.

I will not eat.

A) Valid by modus tollens

B) Fallacy by fallacy of the inverse

C) Fallacy by fallacy of the converse

D) Valid by modus ponens

Use a truth table to determine whether the argument is valid.

31) $p \rightarrow q$

31) _____

q _____

p

A) Valid

B) Invalid

Determine whether the argument is valid or invalid.

32) Loretta's hobby is stamp collecting. If her husband likes to fish, then Loretta's hobby is not stamp collecting. If her husband does not like to fish, then Nathan likes to read. Therefore, Nathan likes to read.

32) _____

A) Valid

B) Invalid

Use the method of writing each premise in symbols in order to write a conclusion that yields a valid argument.

33) If I get robbed, I will go to court.

33) _____

I got robbed.

A) I will not get robbed in court.

B) I will not go to court.

C) I will get robbed in court.

D) I will go to court.

Answer Key

Testname: MATH 100 -- EXAM 1

- 1) B
- 2) C
- 3) D
- 4) A
- 5) B
- 6) D
- 7) A
- 8) B
- 9) A
- 10) D
- 11) C
- 12) B
- 13) B
- 14) C
- 15) A
- 16) B
- 17) D
- 18) A
- 19) A
- 20) A
- 21) B
- 22) A
- 23) A
- 24) C
- 25) D
- 26) C
- 27) D
- 28) B
- 29) A
- 30) B
- 31) B
- 32) A
- 33) D