

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.

List the elements in the set.

- 1) $\{x \mid x \text{ is an integer between } -2 \text{ and } 2\}$ 1) _____
A) $\{-1, 0, 1, 2\}$ B) $\{-2, -1, 0, 1, 2\}$ C) $\{-2, -1, 0, 1\}$ D) $\{-1, 0, 1\}$

Complete the blank with either \in or \notin to make the statement true.

- 2) $2 \underline{\hspace{1cm}} \{11, 10, 9, 8\}$ 2) _____
A) \in B) \notin

Write the set in set-builder notation.

- 3) $\{2, 4, 6, 8\}$ 3) _____
A) $\{x \mid x \text{ is an even natural number}\}$
B) $\{x \mid x \text{ is an even natural number less than } 10\}$
C) $\{x \mid x \text{ is an even integer less than } 10\}$
D) $\{x \mid x \text{ is an even whole number less than } 10\}$

Find $n(A)$ for the set.

- 4) $A = \{x \mid x \text{ is a month in the year}\}$ 4) _____
A) $n(A) = 12$ B) $n(A) = 52$ C) $n(A) = 1$ D) $n(A) = 24$

- 5) $A = \left\{ \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \dots, \frac{1}{29}, \frac{1}{30} \right\}$ 5) _____
A) $n(A) = 31$ B) $n(A) = 29$ C) $n(A) = \text{Infinite}$ D) $n(A) = 30$

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

- 6) $\{11, 12, 13\} \underline{\hspace{1cm}} \{10, 11, 12, 13\}$ 6) _____
A) \subset B) Neither C) \subseteq D) Both \subset and \subseteq

Solve the problem.

- 7) List all possible subsets of the set $\{m, n\}$. 7) _____
A) $\{m\}, \{n\}, \emptyset$ B) $\{m\}, \{n\}$
C) $\{m\}, \{n\}, \{m, n\}, \emptyset$ D) $\{m\}, \{n\}, \{m, n\}$

Find the number of subsets of the set.

- 8) $\{6, 7, 8\}$ 8) _____
A) 6 B) 7 C) 8 D) 3

Find the number of proper subsets of the set.

- 9) $\{\text{poetry, drama, speech, art, film}\}$ 9) _____
A) 31 B) 24 C) 16 D) 32

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

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

A) $\{1, 3, 5, a, c, e\}$

C) $\{1, 5, a, e\}$

B) $\{1, 5, a, c, e\}$

D) $\{1, 2, 4, 5, a, b, c, d, e\}$

10) _____

List the elements in the set .

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

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

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

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

11) $(A \cap B)'$

A) $\{q, s, t, u, v, w, x, y\}$

C) $\{r, t, u, v, w, x, z\}$

B) $\{s, u, w\}$

D) $\{t, v, x\}$

11) _____

12) $C' \cup A'$

A) $\{q, r, s, t, u, v, x, z\}$

C) $\{s, t\}$

B) $\{w, y\}$

D) $\{q, s, u, v, w, x, y, z\}$

12) _____

13) $(A' \cup C) \cap B'$

A) $\{v, x\}$

C) $\{r, t, u, v, w, s, y, z\}$

B) $\{r, t, v, w, x\}$

D) $\{y, z\}$

13) _____

Find the Cartesian product.

14) $A = \{12, 9, 10\}$

$B = \{14, 4\}$

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) $\{(12, 14), (12, 4), (9, 14), (9, 4), (10, 14), (10, 4)\}$

14) _____

Find the indicated cardinal number.

15) Find $n(A \times B)$ given that $A = \{2\}$ and $B = \{1, 3\}$.

A) 2

B) 1

C) 4

D) 3

15) _____

Determine whether the sets are equal, equivalent, both, or neither.

16) $\{72, 40, 27\}$ and $\{40, 27, 72\}$

A) Equivalent

B) Equal

C) Neither

D) Both

16) _____

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.

17) $\{5, 6, 7, 8, \dots\}$

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

↓ ↓ ↓ ↓ ↓

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

17) _____

Find the cardinal number of the set.

18) $\{8, 9, 10, 11, \dots\}$

A) c

B) 4

C) \aleph_0

D) 11

18) _____

19) $\{x \mid x \text{ is a decimal between } 63 \text{ and } 64\}$

A) $2 \aleph_0$

B) c

C) 2

D) \aleph_0

19) _____

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

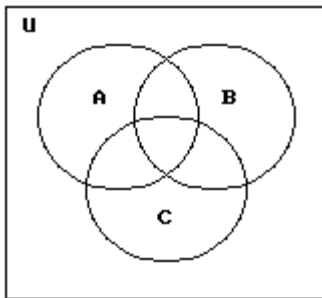
20) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$

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

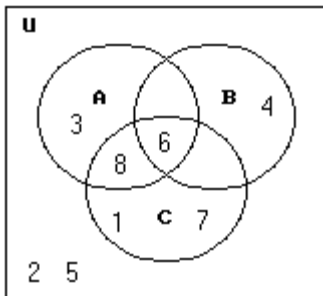
$B = \{4, 6\}$

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

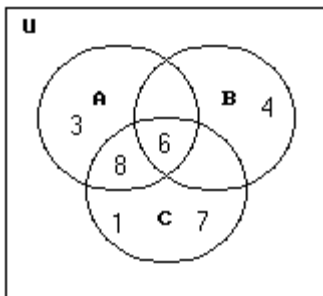
20) _____



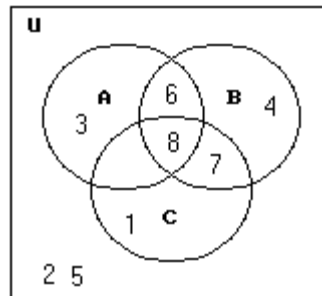
A)



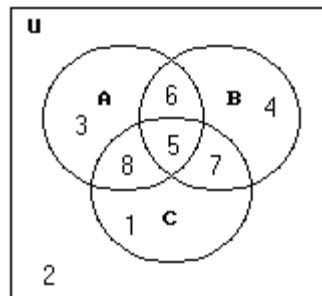
C)



B)



D)



Solve the problem.

- 21) A local television station sent out questionnaires to determine if viewers would rather see a documentary, an interview show, or reruns of a game show. There were 800 responses with the following results: 21) _____
- 240 were interested in an interview show and a documentary, but not reruns.
 - 32 were interested in an interview show and reruns but not a documentary.
 - 112 were interested in reruns but not an interview show.
 - 192 were interested in an interview show but not a documentary.
 - 80 were interested in a documentary and reruns.
 - 48 were interested in an interview show and reruns.
 - 64 were interested in none of the three.

How many are interested in exactly one kind of show?

- A) 384 B) 394 C) 364 D) 374

Let p represent the statement, "Jim plays football", and let q represent the statement "Michael plays basketball". Convert the compound statement into symbols.

- 22) Jim does not play football and Michael does not play basketball. 22) _____
- A) $\sim p \wedge q$ B) $\sim p \wedge \sim q$ C) $\sim(p \wedge q)$ D) $\sim p \vee \sim q$

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

- 23) $\sim p \vee (q \wedge \sim r)$ 23) _____
- A) False B) True

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

- 24) $(\sim p \wedge q) \vee \sim r$ 24) _____
- A) True B) False

Write a negation for the statement.

- 25) Some athletes are musicians. 25) _____
- A) Some athletes are not musicians. B) No athlete is a musician.
- C) Not all athletes are musicians. D) All athletes are musicians.

Construct a truth table for the statement.

- 26) $\sim r \wedge \sim s$ 26) _____
- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>A) $r \quad s \quad (\sim r \wedge \sim s)$</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">F</td></tr> <tr><td>T</td><td>F</td><td>T</td></tr> <tr><td>F</td><td>T</td><td>T</td></tr> <tr><td>F</td><td>F</td><td>T</td></tr> </table> <p>C) $r \quad s \quad (\sim r \wedge \sim s)$</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">F</td></tr> <tr><td>T</td><td>F</td><td>F</td></tr> <tr><td>F</td><td>T</td><td>F</td></tr> <tr><td>F</td><td>F</td><td>T</td></tr> </table> | T | T | F | T | F | T | F | T | T | F | F | T | T | T | F | T | F | F | F | T | F | F | F | T | <p>B) $r \quad s \quad (\sim r \wedge \sim s)$</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">T</td></tr> <tr><td>T</td><td>F</td><td>F</td></tr> <tr><td>F</td><td>T</td><td>F</td></tr> <tr><td>F</td><td>F</td><td>T</td></tr> </table> <p>D) $r \quad s \quad (\sim r \wedge \sim s)$</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">T</td><td style="border-top: 1px solid black;">F</td></tr> <tr><td>T</td><td>F</td><td>F</td></tr> <tr><td>F</td><td>T</td><td>F</td></tr> <tr><td>F</td><td>F</td><td>F</td></tr> </table> | T | T | T | T | F | F | F | T | F | F | F | T | T | T | F | T | F | F | F | T | F | F | F | F |
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| F | T | T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| F | T | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| T | T | T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T | F | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | T | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| T | F | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| F | F | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

- 27) A day late and a dollar short. 27) _____
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.

- 28) Given that $p \vee q$ is false, what can you conclude about the truth values of p and q? 28) _____
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.

- 29) If I pass, I'll party. 29) _____
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.

- 30) If I were young, I would be happy. 30) _____
Converse
A) If I were not happy, I would not be young.
B) If I were young, I would not be happy.
C) If I were not young, I would not be happy.
D) If I were happy, I would be young.

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

- 31) Not all that glitters is gold. 31) _____
My ring glitters.
My ring is not gold.
A) Valid B) Invalid


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

- 32) $p \rightarrow q$ 32) _____
q _____
p _____
A) Valid B) Invalid

Determine whether the argument is valid or invalid.

- 33) 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. 33) _____
A) Valid B) Invalid

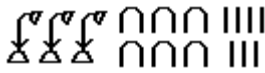
Convert the Egyptian numeral to Hindu-Arabic form.

- 34) 34) _____

A) 3670 B) 367 C) 3067 D) 3607

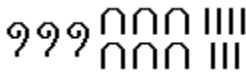
Convert the Hindu-Arabic numeral to Egyptian form.

35) 367

A)



C)



B)



D)



35) _____

Convert the Roman numeral to Hindu-Arabic form.

36) CLXXXV

A) 185

B) 85

C) 105

D) 1085

36) _____

Convert the Hindu-Arabic numeral to Roman form.

37) 1867

A) MDCCLXVII

B) MDCCLLVII

C) MDCCCLXVII

D) MDCCCXLVII

37) _____

Convert the Chinese numeral to Hindu-Arabic form.

38)



A) 520

B) 920

C) 820

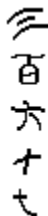
D) 620

38) _____

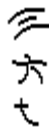
Convert the Hindu-Arabic numeral to Chinese.

39) 367

A)



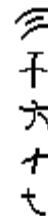
B)



C)



D)



39) _____

Write the number in expanded form.

40) 936

A) $(9 \cdot 10^1) + (3 \cdot 10^2) + (6 \cdot 10^3)$

B) $(9 \cdot 10^2) + (3 \cdot 10^1) + (6 \cdot 10^0)$

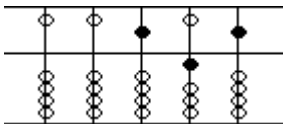
C) $(9 \cdot 10^3) + (3 \cdot 10^2) + (6 \cdot 10^1)$

D) $(9 \cdot 10^0) + (3 \cdot 10^1) + (6 \cdot 10^2)$

40) _____

Identify the number represented on the abacus.

41)



A) 515

B) 191

C) 151

D) 919

41) _____

Solve the problem.

- 42) Write (in the same base) the counting numbers just before and just after 3246_{seven} . 42) _____
A) 3254_{seven} , 3250_{seven} B) 3245_{seven} , 3247_{seven}
C) 165_{seven} , 166_{seven} D) 3245_{seven} , 3250_{seven}

Convert the number to decimal form.

- 43) 275_{eight} 43) _____
A) 283 B) 189 C) 112 D) 1512

Convert the decimal number to the given base.

- 44) 503 to base five 44) _____
A) 4003_{five} B) 3004_{five} C) 4030_{five} D) 3040_{five}

Convert from binary form to the indicated base.

- 45) 11100_{two} to base eight 45) _____
A) 21_{eight} B) 42_{eight} C) 168_{eight} D) 34_{eight}

Convert the number to binary form.

- 46) $FA6_{\text{sixteen}}$ 46) _____
A) $111010110110_{\text{two}}$ B) $111110000011_{\text{two}}$
C) $111110100110_{\text{two}}$ D) $111110110110_{\text{two}}$

Determine the letters or numbers.

- 47) Write the binary code for the letter Q. 47) _____
A) 1010010 B) 1010001 C) 100100 D) 1010100
- 48) Break 110001011001011100100 into groups of seven digits and write as lower case letters. 48) _____
A) arm B) bed C) cue D) bad

Find all natural number factors of the number.

- 49) 42 49) _____
A) 1, 7, 42 B) 1, 2, 3, 7, 6, 14, 21, 42
C) 1, 2, 3, 7, 6, 14, 28, 42 D) 7, 6, 14, 42

Give the prime factorization of the number. Use exponents when possible.

- 50) 396 50) _____
A) $2^4 \cdot 11$ B) $3^4 \cdot 11$ C) $2^3 \cdot 3^2 \cdot 11$ D) $2^2 \cdot 3^2 \cdot 11$

Answer Key

Testname: MATH 100--PRACTICETEST1--2012

- 1) D
- 2) B
- 3) B
- 4) A
- 5) B
- 6) D
- 7) C
- 8) C
- 9) A
- 10) B
- 11) C
- 12) A
- 13) B
- 14) D
- 15) A
- 16) D
- 17) B
- 18) C
- 19) B
- 20) A
- 21) A
- 22) B
- 23) A
- 24) A
- 25) B
- 26) C
- 27) D
- 28) C
- 29) D
- 30) D
- 31) B
- 32) B
- 33) A
- 34) C
- 35) C
- 36) A
- 37) C
- 38) D
- 39) A
- 40) B
- 41) A
- 42) D
- 43) B
- 44) A
- 45) D
- 46) C
- 47) B
- 48) B
- 49) B
- 50) D