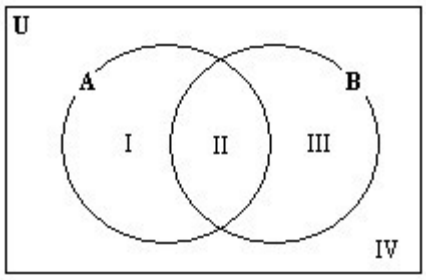
Unit 1 Practice Test Name: _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
Use the Venn diagram shown below to solve the problem.



1. a) Which regions are represented by (A' ∩ B)'?
   b) Which regions are represented by A ∩ B'?
   c) Based on parts a) and b), what can you conclude about the relationship between $(A' \cap B)'$ and $A \cap B'$?

2. a) Which regions are represented by A ∩ B'?
   b) Which regions are represented by (A' ∪ B)'?
   c) Based on parts a) and b), what can you conclude about the relationship between $A \cap B'$ and $(A' \cup B)'$?

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

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}. List the elements in the set.

3. (A ∪ B)'

   A. {s, u, w} B. {t, v, x} C. {r, s, t, u, v, w, x, z} D. {r, t, v, x}

4. A' ∪ B

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

5. C' ∩ A'

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

6. (A ∪ B) ∩ (A ∪ C)

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

7. A ∩ (B ∪ C)

   A. {q, s, u, w, y, z} B. {q, r, w, y, z} C. {q, s, w, y} D. {q, y, z}

Use the formula for the cardinal number of the union of two sets to solve the problem.

8. Set A contains 7 elements, set B contains 15 elements, and 5 elements are common to sets A and B. How many elements are in A ∪ B?

   A. 18 B. 17 C. 16 D. 22

Use a Venn diagram to answer the question.

9. At East Zone University (EZU) there are 771 students taking College Algebra or Calculus. 311 are taking College Algebra, 534 are taking Calculus, and 74 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus?

A. 163 B. 697 C. 237 D.460

10. At East Zone University (EZU) there are 629 students taking College Algebra or Calculus. 247 are taking College Algebra, 406 are taking Calculus, and 24 are taking both College Algebra and Calculus. How many are taking Calculus but not Algebra?

A. 605 B. 199 C. 223 D.382

Find the cardinal number for the set.

11. Determine the cardinal number of the set {x | x is a letter of the alphabet}

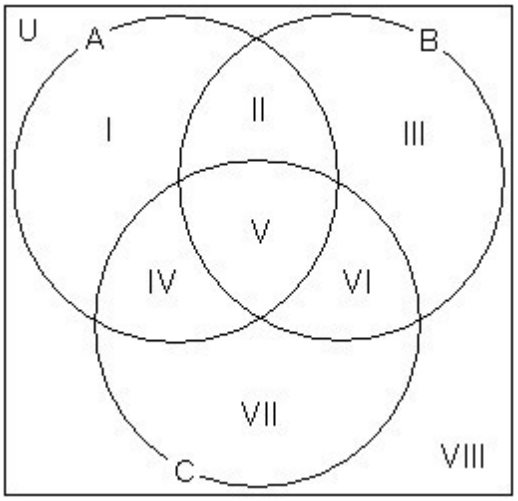
A. 23 B. 26 C. 30 D. 25

The chart shows the most common causes of death in certain areas of the United States.

Most Common Causes of Death in U.S.

Region A	Region B	Region C
1. heart disease	1. heart disease	1. heart disease
2. cerebrovascular	2. cerebrovascular	2. cerebrovascular
3. COPD	3. COPD	3. COPD
4. pneumonia	4. accidents	4. accidents
5. accidents	5. pneumonia	5. liver disease

Use the Venn diagram to indicate in which region each cause should be placed.



12. Heart Disease

A. II B. V C. IV D. VI

13. Pneumonia

A. IV B. VI C. V D. II

14. Liver Disease

A. VII B. IV C. VI D. V

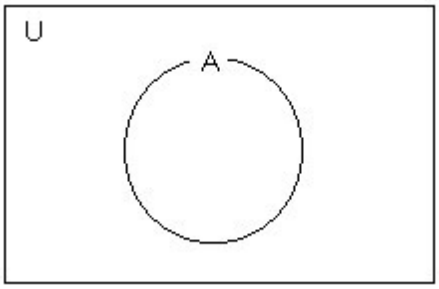
Let U = {1, 2, 4, 5, a, b, c, d, e}. Use the roster method to write the complement of the set.

15. A = {2, 4, b, d}

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

Place the various elements in the proper regions of the following Venn diagram.

16. Let U = {g, h, j, k, m, n} and A = {g, h, n}. Find A'. Then use a Venn diagram to illustrate the relationship among the sets U, A, and A'.



List the elements in the set.

17. The set of the days of the week
A. {Tuesday, Thursday}
B. {Saturday, Sunday}
C. {Friday, Monday, Saturday, Sunday, Thursday, Tuesday, Wednesday}
D. {Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Sunday}

Use sets to solve the problem.
18. Monticello residents were surveyed concerning their preferences for candidates Moore and Allen in an upcoming election. Of the 800 respondents, 300 support neither Moore nor Allen, 100 support both Moore and Allen, and 250 support only Moore. How many residents support Moore or Allen?

A. 300 B. 400 C. 100 D. 500

Are the sets equivalent?
19. A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
B = {a, b, c, d, e, f, g, h, i, j}

A. Yes B. No

Is the following the empty set?

20. {x | x is a day of the week whose name begins with the letter Y}

A. Yes B. No

Write ⊆ or ⊈ in the blank so that the resulting statement is true.

21. {x | x is a tree} _____ {x | x is a birch tree}

A. ⊆ B. ⊈

Are the sets equal?

22. A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
B = {a, b, c, d, e, f, g, h, i, j}

A. Yes B. No

Use the formula for the number of subsets of a set with n elements to solve the problem.

23. Pasta comes with tomato sauce and can be ordered with some, all, or none of these ingredients in the sauce: {onions, garlic, carrots, broccoli, shrimp, mushrooms, zucchini, green pepper}. How many different variations are available for ordering pasta with tomato sauce?

A. 127 B. 255 C. 256 D. 128

Express the set using the roster method.

24. {x | x ∈ N and x is greater than 12}

A. {13, 14, 15,…}
B. {12,13,14,…}
C. {13,14,15}
D. {12,15,17}

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Describe a universal set U that includes all elements in the given sets. Answers may vary.

25. A = {fruit juice, coffee}
B = {tea, spring water}

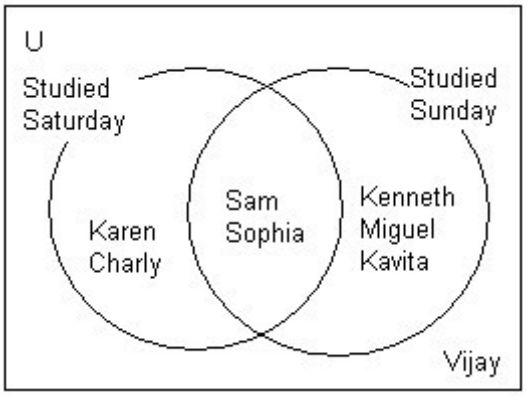
Determine whether the set is finite or infinite.

26. The set of natural numbers less than 50

A. Finite B. Infinte

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

Use the Venn diagram to list the elements of the set in roster form.



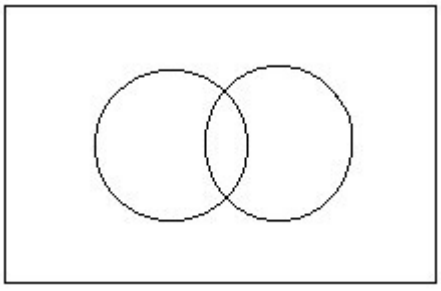
27. The set of students who studied Saturday or Sunday

A. { Sam, Sophia}
B. { Sam, Sophia}
C. { Karen, Charley, Sam, Sophia, Kenneth, Miguel, Kavita}
D. { Karen, Charley, Sam, Sophia, Kenneth, Miguel, Kavita, Vijay}

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.
28. There are 777,859 physicians in the United States.
177,030 are women.
33,947 physicians have cardiology as their specialty.
6,817 women physicians specialize in cardiology.

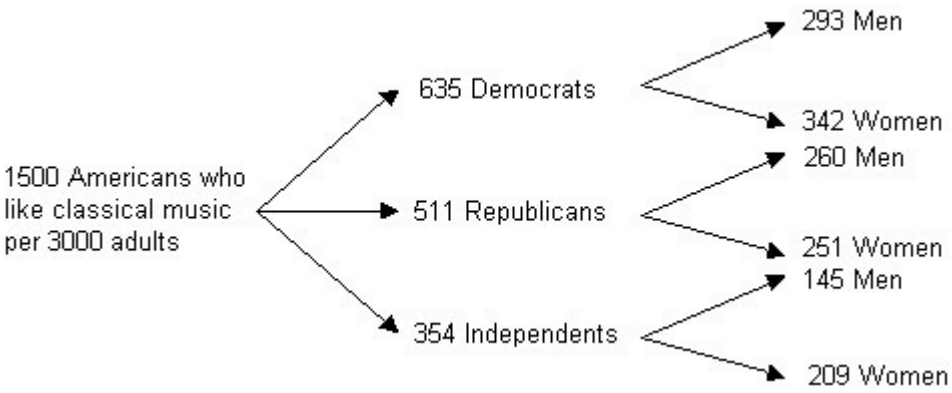
Identify the Venn diagram in which U is the set of all physicians, W is the set of all women physicians, and C is the set of all U.S. physicians specializing in cardiology. Fill in each of the four regions of the Venn diagram with the number of physicians who belong to that region.



Use your Venn diagram to answer the questions.

How many physicians in the United States are there who are men specializing in cardiology?
How many male physicians in the United States do not specialize in cardiology?

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

29. Let M = the set of Independent men who like classical music
W = the set of Independent women who like classical music
The set of elements in M and W combined is equal to set I.

A. True B. False

Fill in the blank with either ∈ or ∉ to make the statement true.

30. 0 _____ ∅

A. ∈
B. ∉