

Review 3 . Sets

MGF 1106 Miami Dade College

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

Determine whether the statement is true or false.

1) $9 \in \{1, 3, 5, 7, 9\}$

A) True

B) False

1) _____

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

2) $49,872$ _____ the set of even natural numbers

A) \notin

B) \in

2) _____

3) 0 _____ \emptyset

A) \notin

B) \in

3) _____

Express the set using the roster method.

4) the set of natural numbers less than or equal to 9

A) $\{0, 1, 2, 3, \dots, 9\}$

B) $\{1, 2, 3, \dots, 9\}$

C) $\{0, 1, 2, 3, \dots, 8\}$

D) $\{1, 2, 3, \dots, 8\}$

4) _____

5) $\{x \mid x \in \mathbb{N} \text{ and } x \text{ is greater than } 13\}$

A) $\{14, 15, 16\}$

B) $\{13, 14, 15, \dots\}$

C) $\{14, 15, 16, \dots\}$

D) $\{14, 16, 18, \dots\}$

5) _____

Express the set using set-builder notation. Use inequality notation to express the condition x must meet in order to be a member of the set.

6) $A = \{6, 7, 8, 9, 10, \dots\}$

A) $\{x \mid x \in \mathbb{N} \text{ and } x \geq 10\}$

B) $\{x \mid x \in \mathbb{N} \text{ and } x > 6\}$

C) $\{x \mid x \in \mathbb{N} \text{ and } x \geq 6\}$

D) $\{x \mid x \in \mathbb{N} \text{ and } x \leq 6\}$

6) _____

Find the cardinal number for the set.

7) $\{27, 29, 31, 33, 35\}$

A) 27

B) 4

C) 6

D) 5

7) _____

8) $\{x \mid x \text{ is a day of the week that begins with the letter N}\}$

A) 1

B) 0

C) 2

D) 3

8) _____

Are the sets equivalent?

9) $A = \{7, 8, 9, 10, 11\}$

$B = \{6, 7, 8, 9, 10\}$

A) Yes

B) No

9) _____

Determine whether the set is finite or infinite.

10) $\{x \mid x \in \mathbb{N} \text{ and } x \geq 1000\}$

A) Finite

B) Infinite

10) _____

11) The set of natural numbers less than 100

A) Finite

B) Infinite

11) _____

Are the sets equal?

12) $\{p, q, r, s\} = \{q, s, r, p\}$

A) Yes

B) No

12) _____

Write \subseteq or $\not\subseteq$ in the blank so that the resulting statement is true.

13) $\{6, 8, 10\}$ ___ $\{5, 6, 7, 8, 10\}$

A) \subseteq

B) $\not\subseteq$

13) _____

14) $\{14, 27, 32\}$ ___ $\{19, 27, 32, 42\}$

A) \subseteq

B) $\not\subseteq$

14) _____

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

15) $\{a, b\}$ ___ $\{z, a, y, b, x, c\}$

A) \subseteq

B) $\not\subseteq$

C) \subset and \subseteq

D) \subset

15) _____

Calculate the number of subsets and the number of proper subsets for the set.

16) $\{1, 3, 5, 7, 9, 11\}$

A) 62; 63

B) 63; 64

C) 63; 62

D) 64; 63

16) _____

17) the set of words describing the colors on a stoplight

A) 7; 8

B) 16; 15

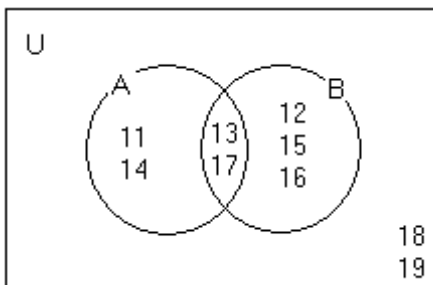
C) 8; 7

D) 15; 16

17) _____

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

18) List the elements of A.



A) $\{12, 15, 16\}$

B) $\{11, 13, 14, 17\}$

C) $\{11, 12, 13\}$

D) $\{13, 17\}$

18) _____

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

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

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

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

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

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

19) _____

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.

20) $A \cap B'$

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

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

C) $\{u, w\}$

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

20) _____

21) $C' \cap A'$

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

B) $\{r, t\}$

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

D) $\{w, y\}$

21) _____

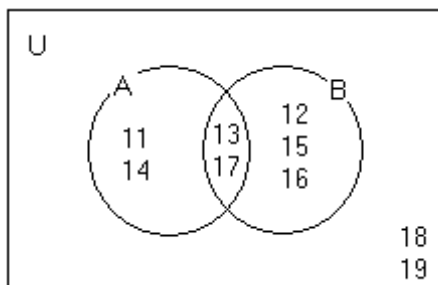
22) $(A \cup B)'$ 22) _____
 A) {t, v, x} B) {s, u, w}
 C) {r, s, t, u, v, w, x, z} D) {r, t, v, x}

23) $A' \cup B$ 23) _____
 A) {r, s, t, u, v, w, x, z} B) {s, u, w}
 C) {q, s, t, u, v, w, x, y} D) {q, r, s, t, v, x, y, z}

24) $A \cap B'$ 24) _____
 A) {u, w} B) {q, s, t, u, v, w, x, y}
 C) {t, v, x} D) {r, s, t, u, v, w, x, z}

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

25) 25) _____



$A \cup B$
 A) {11, 12, 13, 14, 15, 16, 17, 18, 19} B) {13, 17}
 C) {11, 12, 13, 14, 15, 16, 17} D) {11, 12, 14, 15, 16}

Use sets to solve the problem.

26) Results of a survey of fifty students indicate that 30 like red jelly beans, 29 like green jelly beans, and 17 like both red and green jelly beans. How many of the students surveyed like red or green jelly beans? 26) _____
 A) 13 B) 42 C) 17 D) 25

27) Mrs. Bollo's second grade class of thirty students conducted a pet ownership survey. Results of the survey indicate that 8 students own a cat, 15 students own a dog, and 5 students own both a cat and a dog. How many of the students surveyed own neither a cat nor a dog? 27) _____
 A) 25 B) 12 C) 3 D) 10

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

28) Set A contains 5 elements, set B contains 11 elements, and 3 elements are common to sets A and B. How many elements are in $A \cup B$? 28) _____
 A) 13 B) 14 C) 16 D) 12

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.

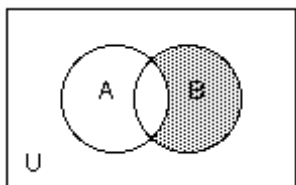
29) $A \cup (B \cap C)$ 29) _____
 A) {q, w, y} B) {q, y, z} C) {q, r, w, y, z} D) {q, s, u, w, y, z}

30) $A \cap (B \cup C)$ A) {q, r, w, y, z} B) {q, s, u, w, y, z} C) {q, y, z} D) {q, s, w, y} 30) _____

31) $(A \cup B) \cap (A \cup C)$ A) {q, s, u, w, y, z} B) {q, s, u, w, y} C) {r, t, v, x} D) {q, s, w, y} 31) _____

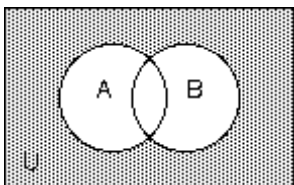
Use set notation to identify the shaded region.

32) _____ 32) _____



- A) $A \cap \bar{B}$ B) $B \cap \bar{A}$ C) $B - \bar{A}$ D) $A - B$

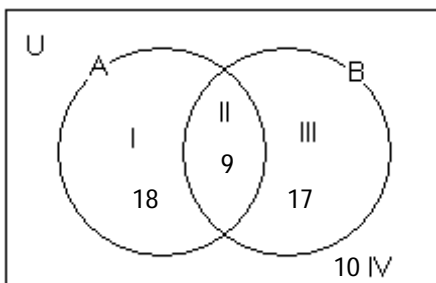
33) _____ 33) _____



- A) $A \cup B$ B) $A - B$ C) $\bar{A} \cap \bar{B}$ D) $\overline{A \cap B}$

Use the accompanying Venn diagram that shows the number of elements in regions I through IV to answer the question.

34) _____ 34) _____



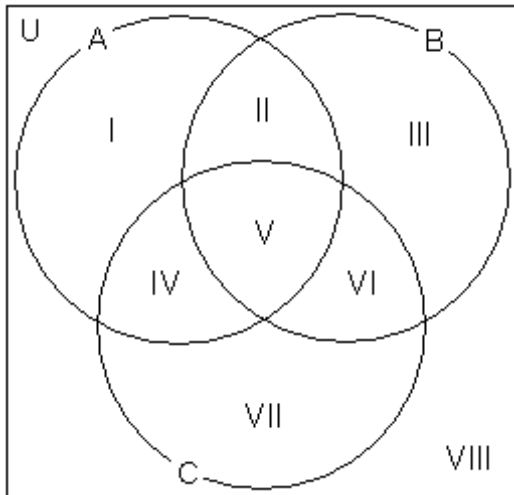
How many elements belong to set A or set B?

- A) 44 B) 9 C) 54 D) 35

Use the given cardinalities to determine the number of elements in the specific region.

35) $n(U) = 114$, $n(A) = 36$, $n(B) = 56$, $n(C) = 31$, $n(A \cap B) = 13$, $n(A \cap C) = 16$, $n(B \cap C) = 12$, $n(A \cap B \cap C) = 7$ 35) _____

Find III.



A) 17

B) 8

C) 38

D) 24

Use a Venn diagram to answer the question.

36) At East Zone University (EZU) there are 775 students taking College Algebra or Calculus. 412 are taking College Algebra, 392 are taking Calculus, and 29 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus? 36) _____

A) 363

B) 354

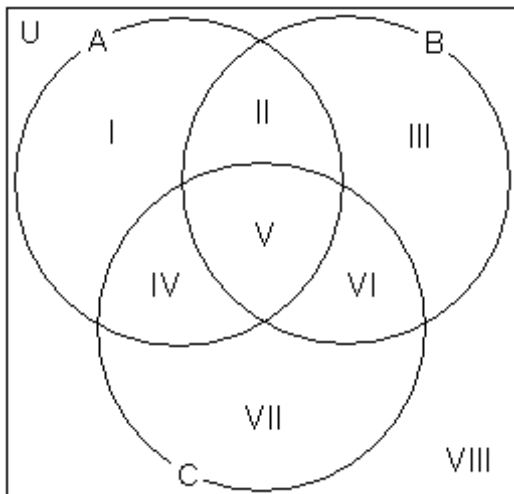
C) 746

D) 383

Use the given cardinalities to determine the number of elements in the specific region.

37) $n(U) = 224$, $n(A) = 76$, $n(B) = 96$, $n(C) = 81$, $n(A \cap B) = 33$, $n(A \cap C) = 36$, $n(B \cap C) = 32$, $n(A \cap B \cap C) = 17$ 37) _____

Find VIII.



A) 55

B) 89

C) 0

D) 76