

Exam

Name _____

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

List the elements in the set.

- 1) $\{x \mid x \text{ is a whole number between 6 and 10}\}$ 1) _____
A) $\{6, 7, 8, 9\}$ B) $\{7, 8, 9\}$ C) $\{7, 8, 9, 10\}$ D) $\{6, 7, 8, 9, 10\}$

Answer: B

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

Answer: A

- 3) $\{x \mid x \text{ is a negative multiple of 8}\}$ 3) _____
A) $\{-8, -64, -512, \dots\}$ B) $\{-8, -16, -24, \dots\}$
C) $\{0, -8, -16, \dots\}$ D) $\{8, 16, 24, \dots\}$

Answer: B

- 4) $\{x \mid x \text{ is an integer greater than 0}\}$ 4) _____
A) $\{-1, -2, -3\}$ B) $\{-1, -2, -3, \dots\}$ C) $\{1, 2, 3, 4\}$ D) $\{1, 2, 3, \dots\}$

Answer: D

- 5) The set of all whole numbers greater than 6 and less than 10 5) _____
A) $\{7, 8, 9, 10\}$ B) $\{6, 7, 8, 9, 10\}$ C) $\{7, 8, 9\}$ D) $\{6, 7, 8, 9\}$

Answer: C

- 6) $\{x \mid x \text{ is a counting number multiple of 2}\}$ 6) _____
A) $\{4, 6, 8, \dots\}$ B) $\{0, 2, 4, 6, \dots\}$ C) $\{2, 4, 6, \dots\}$ D) $\emptyset$

Answer: C

- 7) $\{x \mid x \text{ is a counting number less than } -2\}$ 7) _____
A) $\{\dots, -5, -4, -3\}$ B) $\{-1, 0, 1, \dots\}$ C) $\{-3, -4, -5, \dots\}$ D) $\emptyset$

Answer: D

- 8) The set of all positive integer powers of 3. 8) _____
A) $\{1, 3, 9, 27, 81, 243, \dots\}$ B) $\{3, 6, 9, 12, 15, \dots\}$
C) $\{1, 8, 27, 64, 125, \dots\}$ D) $\{3, 9, 27, 81, 243, \dots\}$

Answer: D

- 9) $\{x \mid x \text{ is an even integer smaller than 8}\}$ 9) _____
A) $\{2, 4, 6\}$ B) $\{0, 2, 4, 6\}$
C) $\{\dots, -6, -4, -2, 2, 4, 6\}$ D) $\{\dots, -6, -4, -2, 0, 2, 4, 6\}$

Answer: D

10) The set of the days of the week

10) _____

- A) {Tuesday, Thursday}
- B) {Friday, Monday, Saturday, Sunday, Thursday, Tuesday, Wednesday}
- C) {Saturday, Sunday}
- D) {Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Sunday}

Answer: B

Write the set in set-builder notation.

11) {4}

11) _____

- A) $\{x \mid x \text{ is the natural number } 4\}$
- B) $\{x \mid x \text{ is a natural number}\}$
- C) $\{x\}$
- D) $\{x \text{ is a constant}\}$

Answer: A

12) {2, 4, 6, 8}

12) _____

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

Answer: B

13) {17, 18, 19, 20}

13) _____

- A) $\{x \mid x \text{ is an integer between } 17 \text{ and } 20\}$
- B) $\{x \mid x \text{ is an integer less than } 21\}$
- C) {17, 18, 19, 20}
- D) $\{x \mid x \text{ is an integer between } 16 \text{ and } 21\}$

Answer: D

14) {-2, -1, 0, 1, ...}

14) _____

- A) $\{x \mid x \text{ is an integer greater than } -3\}$
- B) $\{x \mid x \text{ is an integer between } -3 \text{ and } 2\}$
- C) {-2, -1, 0, 1}
- D) $\{x \mid x \text{ is any integer}\}$

Answer: A

15) {..., -3, -2, -1, 0, 1, 2, 3, ...}

15) _____

- A) {-3, -2, -1, 0, 1, 2, 3}
- B) $\{x \mid x \text{ is a natural number}\}$
- C) $\{x \mid x \text{ is any integer greater than } -3\}$
- D) $\{x \mid x \text{ is an integer}\}$

Answer: D

16) {9, 12, 15, 18, ..., 39}

16) _____

- A) $\{x \mid x \text{ is a multiple of } 3 \text{ between } 6 \text{ and } 42\}$
- B) $\{x \mid x \text{ is a multiple of } 3 \text{ greater than } 9\}$
- C) $\{x \mid x \text{ is a multiple of } 3\}$
- D) $\{x \mid x \text{ is a multiple of } 3 \text{ between } 9 \text{ and } 39\}$

Answer: A

17) {-3, -1, 1, 3, 5, ...}

17) _____

- A) $\{x \mid x \text{ is an odd integer greater than } -4\}$
- B) $\{x \mid x \text{ is an odd integer between } -4 \text{ and } 6\}$
- C) $\{x \mid x \text{ is an odd integer}\}$
- D) $\{x \mid x \text{ is an integer greater than } -4\}$

Answer: A

- 18) $\{2, 4, 8, 16, 32, \dots\}$ 18) _____
 A) $\{x \mid x \text{ is a positive multiple of } 2\}$
 B) $\{x \mid x \text{ is a positive multiple of } 4\}$
 C) $\{x \mid x \text{ is a positive integer power of } 2\}$
 D) $\{x \mid x \text{ is an integer power of } 2\}$
 Answer: C
- 19) The set of all calculus books 19) _____
 A) $\{\text{any calculus book}\}$ B) $\{x \mid x \text{ is a calculus book}\}$
 C) $\{x \mid x \text{ is a calculus book}\}$ D) $\{\text{a calculus book}\}$
 Answer: B
- 20) The set of all cars owned by students 20) _____
 A) $\{x \mid x \text{ is a student with a car}\}$ B) $\{x \mid x \text{ is a car owned by a student}\}$
 C) $\{x \mid x \text{ is a student with a car}\}$ D) $\{x \mid x \text{ is a car}\}$
 Answer: B
- Identify the set as finite or infinite.
- 21) $\{7, 8, 9, \dots, 28\}$ 21) _____
 A) Finite B) Infinite
 Answer: A
- 22) $\left\{1, \frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \dots\right\}$ 22) _____
 A) Finite B) Infinite
 Answer: B
- 23) $\{x \mid x \text{ is a counting number larger than } 398\}$ 23) _____
 A) Infinite B) Finite
 Answer: A
- 24) $\{x \mid x \text{ is an odd counting number}\}$ 24) _____
 A) Finite B) Infinite
 Answer: B
- 25) $\{x \mid x \text{ is a 12-headed lizard}\}$ 25) _____
 A) Infinite B) Finite
 Answer: B
- 26) $\{x \mid x \text{ is a fraction between } 52 \text{ and } 53\}$ 26) _____
 A) Infinite B) Finite
 Answer: A
- 27) $\{x \mid x \text{ is a prime number}\}$ 27) _____
 A) Infinite B) Finite
 Answer: A

- 28) $\left\{1, \frac{3}{7}, \frac{9}{49}, \frac{27}{343}, \dots, \frac{243}{16807}\right\}$ 28) _____
 A) Infinite B) Finite
 Answer: B

Find $n(A)$ for the set.

- 29) $A = \{2, 4, 6, 8, 10\}$ 29) _____
 A) $n(A) = 2$ B) $n(A) = 4$ C) $n(A) = 5$ D) $n(A) = 10$

Answer: C

- 30) $A = \{700, 701, 702, \dots, 7000\}$ 30) _____
 A) $n(A) = 6301$ B) $n(A) = 4$ C) $n(A) = 6300$ D) $n(A) = 7000$

Answer: A

- 31) $A = \{x \mid x \text{ is a month in the year}\}$ 31) _____
 A) $n(A) = 1$ B) $n(A) = 24$ C) $n(A) = 12$ D) $n(A) = 52$

Answer: C

- 32) $A = \{x \mid x \text{ is a number on a clock face}\}$ 32) _____
 A) $n(A) = 12$ B) $n(A) = 3$ C) $n(A) = 24$ D) $n(A) = 6$

Answer: A

- 33) $A = \{x \mid x \text{ is a second in a minute}\}$ 33) _____
 A) $n(A) = 12$ B) $n(A) = 60$ C) $n(A) = \text{Infinite}$ D) $n(A) = 120$

Answer: B

- 34) $A = \{3, 3, 4, 4, \dots, 7, 7\}$ 34) _____
 A) $n(A) = 6$ B) $n(A) = 5$ C) $n(A) = 3$ D) $n(A) = 10$

Answer: B

- 35) $A = \{-9, -8, -7, \dots, 0\}$ 35) _____
 A) $n(A) = 10$ B) $n(A) = 4$ C) $n(A) = 9$ D) $n(A) = 1$

Answer: A

- 36) $A = \left\{\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \dots, \frac{1}{29}, \frac{1}{30}\right\}$ 36) _____
 A) $n(A) = 29$ B) $n(A) = 31$ C) $n(A) = \text{Infinite}$ D) $n(A) = 30$

Answer: A

- 37) $A = \left\{\frac{1}{2}, -\frac{1}{2}, \frac{2}{3}, -\frac{2}{3}, \frac{3}{4}, -\frac{3}{4}, \dots, \frac{19}{20}, -\frac{19}{20}\right\}$ 37) _____
 A) $n(A) = 38$ B) $n(A) = \text{Infinite}$ C) $n(A) = 40$ D) $n(A) = 19$

Answer: A

Determine whether or not the set is well defined.

- 38) $\{x \mid x \text{ is a tennis player who has won at Wimbledon}\}$ 38) _____
 A) Not well defined B) Well defined

Answer: B

- 39) $\{x \mid x \text{ is a low-fat ice cream}\}$ 39) _____
 A) Not well defined B) Well defined
 Answer: A
- 40) $\{x \mid x \text{ is a football team that has won the Super Bowl}\}$ 40) _____
 A) Well defined B) Not well defined
 Answer: A
- 41) $\{x \mid x \text{ is a adventure book in the library}\}$ 41) _____
 A) Well defined B) Not well defined
 Answer: B
- 42) $\{x \mid x \text{ is a stock on the AmEx today}\}$ 42) _____
 A) Well defined B) Not well defined
 Answer: A
- 43) $\{x \mid x \text{ is an expensive boat on the Great Lakes}\}$ 43) _____
 A) Well defined B) Not well defined
 Answer: B
- 44) $\{x \mid x \text{ is a four-year college in Utah}\}$ 44) _____
 A) Not well defined B) Well defined
 Answer: B
- Complete the blank with either $\in$ or $\notin$ to make the statement true.
- 45) $-8 \underline{\hspace{1cm}} \{8, 10, 12, \dots, 20\}$ 45) _____
 A) $\in$ B) $\notin$
 Answer: B
- 46) $0 \underline{\hspace{1cm}} \{-1, 1, 3, 16, 26\}$ 46) _____
 A) $\notin$ B) $\in$
 Answer: A
- 47) $\{8\} \underline{\hspace{1cm}} \{\{5\}, \{6\}, \{7\}, \{8\}, \{9\}\}$ 47) _____
 A) $\in$ B) $\notin$
 Answer: A
- 48) $2 \underline{\hspace{1cm}} \{11, 10, 9, 8\}$ 48) _____
 A) $\in$ B) $\notin$
 Answer: B
- 49) $7 \underline{\hspace{1cm}} \{4, 20, 5, 7, 12\}$ 49) _____
 A) $\notin$ B) $\in$
 Answer: B
- 50) $5 \underline{\hspace{1cm}} \{3, 4, 5, 6\}$ 50) _____
 A) $\notin$ B) $\in$
 Answer: B

51) $a _ \{A, B, C, \dots, Z\}$

A) $\in$

Answer: B

B) $\notin$

51) _____

52) $9 _ \{4, 5, 6, \dots, 9\}$

A) $\in$

Answer: A

B) $\notin$

52) _____

53) $\{-5\} _ \{-4 - 3, -3 - 3, -2 - 3, -1 - 3\}$

A) $\notin$

Answer: A

B) $\in$

53) _____

54) $4 _ \{5 + 5, 3 + 5, 1 + 5, -1 + 5\}$

A) $\notin$

Answer: B

B) $\in$

54) _____

Tell whether the statement is true or false.

55) $9 \in \{18, 27, 36, 45, 54\}$

A) True

Answer: B

B) False

55) _____

56) $\{2, 8, 13\} = \{0, 2, 8, 13\}$

A) True

Answer: B

B) False

56) _____

57) $17 \notin \{16, 14, 13, \dots, 1\}$

A) True

Answer: A

B) False

57) _____

58) $\{8\} = \{x \mid x \text{ is an even counting number between } 10 \text{ and } 16\}$

A) True

Answer: B

B) False

58) _____

59) $\{52, 53, 52, 53\} = \{52, 53\}$

A) True

Answer: A

B) False

59) _____

60) $\{2, 17, 28, 7, 36\} = \{36, 17, 7, 82, 2\}$

A) True

Answer: B

B) False

60) _____

61) $\{x \mid x \text{ is a counting number greater than } 35\} = \{35, 36, 37, \dots\}$

A) True

Answer: B

B) False

61) _____

62) $9 \notin \{x \mid x \text{ is an even counting number}\}$

A) True

Answer: A

B) False

62) _____

63) $k \notin \{p, a, k, h, v\}$

A) True

Answer: B

B) False

63) _____

64) $\{s, q, y, o, d\} = \{o, d, q, s, y\}$

A) True

Answer: A

B) False

64) _____

Write true or false for the following statement.

Let $A = \{3, 5, 7, 9, 11, 13\}$

$B = \{3, 5, 9, 11\}$

$C = \{5, 9, 13\}$

65) $9 \notin C$

A) True

Answer: B

B) False

65) _____

66) $9 \in B$

A) True

Answer: A

B) False

66) _____

67) Every element of B is also an element of C.

A) True

Answer: B

B) False

67) _____

68) $A = \{x \mid x \text{ is an odd counting number greater than 1 and less than 15}\}$

A) True

Answer: A

B) False

68) _____

69) $0 \in A$

A) True

Answer: B

B) False

69) _____

70) Every element of C is also an element of A.

A) True

Answer: A

B) False

70) _____

71) $\{x \mid x \text{ is an odd counting number less than 15}\} = A$

A) True

Answer: B

B) False

71) _____

72) $\{13\} \in B$

A) True

Answer: B

B) False

72) _____

Use $\subseteq$ or $\not\subseteq$ in the blank to make a true statement.

73) $\{4, 6, 8\} \underline{\hspace{1cm}} \{3, 4, 5, 6, 8\}$

A) $\subseteq$

Answer: A

B) $\not\subseteq$

73) _____

- 74) $\{12, 39, 44\} \underline{\hspace{1cm}} \{9, 39, 44, 54\}$ 74) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: A
- 75) $\{b, d, f, h\} \underline{\hspace{1cm}} \{b, d, f, h, k\}$ 75) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: B
- 76) $\emptyset \underline{\hspace{1cm}} \emptyset$ 76) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: B
- 77) $\{3, 5, 7\} \underline{\hspace{1cm}} \{x \mid x \text{ is an odd counting number}\}$ 77) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: B
- 78) $\{e, n, j\} \underline{\hspace{1cm}} \{e, e, n, n, j, j\}$ 78) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: B
- 79) $\{x \mid x \text{ is a counting number larger than } 5\} \underline{\hspace{1cm}} \{7, 8, 9, \dots\}$ 79) _____
 A) $\not\subseteq$ B) $\subseteq$
 Answer: A

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

- 80) $\{9, 10, 11\} \underline{\hspace{1cm}} \{8, 9, 10, 11\}$ 80) _____
 A) $\subseteq$ B) Neither C) Both $\subset$ and $\subseteq$ D) $\subsetneq$
 Answer: C
- 81) $\emptyset \underline{\hspace{1cm}} \{7, 15, 24, 34\}$ 81) _____
 A) Neither B) $\subset$ C) $\subseteq$ D) Both $\subset$ and $\subseteq$
 Answer: D
- 82) $\{5, 6, 7\} \underline{\hspace{1cm}} \{5, 6, 7\}$ 82) _____
 A) $\subset$ B) Both $\subset$ and $\subseteq$ C) Neither D) $\subseteq$
 Answer: D
- 83) $\{0\} \underline{\hspace{1cm}} \emptyset$ 83) _____
 A) $\subset$ B) $\subseteq$ C) Both $\subset$ and $\subseteq$ D) Neither
 Answer: D
- 84) $\{a, b\} \underline{\hspace{1cm}} \{z, a, y, b, x, c\}$ 84) _____
 A) Both $\subset$ and $\subseteq$ B) $\subseteq$ C) $\subset$ D) Neither
 Answer: A
- 85) $\{s, r, t\} \underline{\hspace{1cm}} \{s, r, t\}$ 85) _____
 A) Both $\subseteq$ and $\subset$ B) $\subset$ C) $\subseteq$ D) Neither
 Answer: C

Determine whether the statement is true or false.

Let $A = \{1, 3, 5, 7\}$

$B = \{5, 6, 7, 8\}$

$C = \{5, 8\}$

$D = \{2, 5, 8\}$

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

86) $C \subset D$

A) True

B) False

86) _____

Answer: A

87) $\emptyset \subseteq A$

A) True

B) False

87) _____

Answer: A

88) $\{6, 5, 8, 7\} \subseteq B$

A) True

B) False

88) _____

Answer: A

89) $D \subseteq B$

A) True

B) False

89) _____

Answer: B

90) $A \neq \{7, 5, 3, 1\}$

A) True

B) False

90) _____

Answer: B

91) $\{5\} \subseteq D$

A) True

B) False

91) _____

Answer: A

92) $\{0\} \subseteq U$

A) True

B) False

92) _____

Answer: B

93) $\{8, 5, 2\} \subset D$

A) True

B) False

93) _____

Answer: B

94) $C \not\subseteq B$

A) True

B) False

94) _____

Answer: B

95) $C \not\subseteq A$

A) True

B) False

95) _____

Answer: A

Find the number of subsets of the set.

96) $\{5, 6, 7\}$

A) 3

B) 6

C) 8

D) 7

96) _____

Answer: C

97) $\{x \mid x \text{ is an even number between 11 and 27}\}$

A) 256

B) 7

C) 53

D) 128

97) _____

Answer: A

98) $\{0\}$

A) 2

B) 0

C) 1

D) 4

98) _____

Answer: A

99) $\{\text{mom, dad, son, daughter}\}$

A) 8

B) 12

C) 16

D) 14

99) _____

Answer: C

100) $\{\text{math, English, history, science, art}\}$

A) 24

B) 16

C) 32

D) 28

100) _____

Answer: C

101) $\{x \mid x \text{ is a day of the week}\}$

A) 124

B) 127

C) 256

D) 128

101) _____

Answer: D

102) $\{1, 2, 3, \dots, 9\}$

A) 16

B) 508

C) 512

D) 1024

102) _____

Answer: C

Find the number of proper subsets of the set.

103) $\{7, 8, 9\}$

A) 2

B) 5

C) 6

D) 7

103) _____

Answer: D

104) $\{x \mid x \text{ is an even number between 19 and 33}\}$

A) 128

B) 64

C) 127

D) 32

104) _____

Answer: C

105) $\{0\}$

A) 2

B) 4

C) 0

D) 1

105) _____

Answer: D

106) $\{\text{car, boat, truck, train}\}$

A) 16

B) 14

C) 15

D) 8

106) _____

Answer: C

107) $\{\text{poetry, drama, speech, art, film}\}$

A) 24

B) 16

C) 31

D) 32

107) _____

Answer: C

- 108) $\{x \mid x \text{ is a day of the week}\}$ 108) _____
 A) 128 B) 64 C) 127 D) 256
 Answer: C
- 109) $\{1, 2, 3, \dots, 8\}$ 109) _____
 A) 250 B) 511 C) 256 D) 255
 Answer: D
- Let $U = \{1, 2, 4, 5, a, b, c, d, e\}$. Find the complement of the set.
- 110) $A = \{2, 4, b, d\}$ 110) _____
 A) $\{1, 5, a, e\}$ B) $\{1, 2, 4, 5, a, b, c, d, e\}$
 C) $\{1, 5, a, c, e\}$ D) $\{1, 3, 5, a, c, e\}$
 Answer: C
- 111) $S = \{1, 5, e, d, a\}$ 111) _____
 A) $\{2, 4, b, c\}$ B) $\{2, 3, 4, a, b, c\}$ C) $\{1, 2, 4, b, c\}$ D) $\{2, 3, 4, b, c\}$
 Answer: A
- 112) $V = \{1, 2, 4, 5, a, b, c, e\}$ 112) _____
 A) $\{3, d\}$ B) $\{u\}$ C) $\emptyset$ D) $\{d\}$
 Answer: D
- 113) $T = \{a, b, c, d\}$ 113) _____
 A) $\{1, 2, 3, 4, 5, e\}$ B) $\{e\}$ C) $\{1, 2, 4, 5\}$ D) $\{1, 2, 4, 5, e\}$
 Answer: D
- 114) $N = \{a\}$ 114) _____
 A) $\{1, 2, 4, 5, b, c, d, e\}$ B) $\{1, 2, 5, b, c, d, e\}$
 C) $\{1, 2, 3, 4, 5, b, c, d, e\}$ D) $\{u, v\}$
 Answer: A
- 115) $S = \emptyset$ 115) _____
 A) $\emptyset$ B) $\{0\}$ C) U D) $\emptyset$
 Answer: C
- 116) $P = \{a, b, d, e, 1, 2, 4, 5\}$ 116) _____
 A) $\{c, 3\}$ B) $\emptyset$ C) $\{c\}$ D) U
 Answer: C
- 117) $R = \{1, 2, 5, b, d\}$ 117) _____
 A) $\{3, 4, a, b, c, e\}$ B) $\{4, a, b, c, e\}$ C) $\{4, a, c, e\}$ D) $\{3, 4, a, c, e\}$
 Answer: C
- 118) $T = U$ 118) _____
 A) T B) $\emptyset$ C) $\{U - T\}$ D) U
 Answer: B
- 119) $O = \{e, a, c, 4, 5\}$ 119) _____
 A) $\{1, 2, 3, b, d\}$ B) $\{b, d, 1, 2, 3\}$ C) $\{1, 2, b, d\}$ D) $\{1, 2, b, c, d\}$
 Answer: C

The lists below show five agricultural crops in Alabama, Arkansas, and Louisiana.

<u>Alabama</u>	<u>Arkansas</u>	<u>Louisiana</u>
soybeans (s)	soybeans (s)	soybeans (s)
peanuts (p)	rice (r)	sugarcane (n)
corn (c)	cotton (t)	rice (r)
hay (h)	hay (h)	corn (c)
wheat (w)	wheat (w)	cotton (t)

Let U be the smallest possible universal set that includes all of the crops listed, and let A , K and L be the sets of five crops in Alabama, Arkansas, and Louisiana, respectively. Find each of the following sets.

- 120) The set of crops in U . 120) _____
- A) $\{s, p, c, w, r, t, n\}$ B) $\{s, p, c, h, w, s, r, t, h, w, s, n, r, c, t\}$
- C) $\{s, p, c, h, w, r, t, n, c\}$ D) $\{c, h, n, p, r, s, t, w\}$

Answer: D

- 121) The set of crops in A' . 121) _____
- A) $\{n, r, t\}$ B) $\{c, h, n, r, s, t, w\}$
- C) $\{h, n, r, t\}$ D) $\{r, t\}$

Answer: A

- 122) The set of crops in both A and K 122) _____
- A) $\{c, p, r, t\}$ B) $\{c, h, s, t, w\}$
- C) $\{c, h, p, r, s, t, w\}$ D) $\{h, s, w\}$

Answer: D

- 123) The set of crops in both L and K 123) _____
- A) $\{c, h, n, r, s, t, w\}$ B) $\{c, n, r, s, t\}$
- C) $\{r, s, t\}$ D) $\{c, h, n, w\}$

Answer: C

- 124) The set of crops in both L and K' 124) _____
- A) $\{c, n, p\}$ B) $\{r, s, t\}$ C) $\{c, n\}$ D) $\{h, w\}$

Answer: C

- 125) The set of crops in both A and L' 125) _____
- A) $\{c, s\}$ B) $\{h, n, t, w\}$ C) $\{n, r, t\}$ D) $\{h, p, w\}$

Answer: D

- 126) The set of crops in both A' and K' 126) _____
- A) $\emptyset$ B) $\{n\}$ C) $\{c, p, r, t\}$ D) $\{c, n, p, r, t\}$

Answer: B

- 127) The set of crops common to A , K , and L 127) _____
- A) $\{s\}$ B) $\{c, h, n, p, r, s, t, w\}$
- C) $\{n, p, s\}$ D) $\{n, p\}$

Answer: A

- 128) The set of crops in either A or L or both 128) _____
 A) {c, n, p} B) {c,s}
 C) {h, n, p, r, t, w} D) {c, h, n, p, r, s, t, w}
 Answer: D

- 129) The set of crops in either A' or L or both 129) _____
 A) {n, r, t} B) {h, p, w} C) {h, n, p, r, t, w} D) {c, n, r, s, t}
 Answer: D

Solve the problem.

- 130) List all possible subsets of the set {m, n}. 130) _____
 A) {m}, {n}, $\emptyset$ B) {m}, {n}, {m, n}, $\emptyset$
 C) {m}, {n}, {m, n} D) {m}, {n}
 Answer: B

- 131) List all possible proper subsets of the set {2, 6, 7}. 131) _____
 A) {2}, {6}, {7}, {2, 6}, {2, 7}, {6, 7}, {2, 6, 7} B) $\emptyset$, {2}, {6}, {7}, {2, 6}, {2, 7}, {6, 7}, {2, 6, 7}
 C) $\emptyset$, {2}, {6}, {7}, {2, 6}, {2, 7}, {6, 7} D) {2}, {6}, {7}, {2, 6}, {2, 7}, {6, 7}
 Answer: C

- 132) A committee is to be formed. Possible candidates for the committee are Eric, Frances, Greg, and Jose. Denoting these four people by e, f, g, j, list all possible committees of two people (ie list all possible subsets of size two). 132) _____
 A) {e, f}, {e, g}, {e, j}, {f, g}, {f, j}, {g, j}, {f, e}, {g, e}
 B) {e, f}, {e, g}, {f, g}, {g, j}
 C) {e, f}, {e, g}, {e, j}, {f, g}, {f, j}, {g, j}
 D) {e, f}, {e, g}, {e, j}, {f, j}, {g, j}
 Answer: C

- 133) A committee is to be formed. Possible candidates for the committee are Eric, Frances, Greg, and Jose. Denoting these four people by e, f, g, j, list all possible committees if the committee is to contain at least two people and may contain up to four people. 133) _____
 A) {e, f}, {e, g}, {e, j}, {f, g}, {f, j}, {g, j}, {e, f, g}, {e, f, j}, {f, g, j}, {e, f, g, j}
 B) {e, f}, {e, g}, {e, j}, {f, g}, {f, j}, {g, j}, {e, f, g}, {e, f, j}, {e, g, j}, {f, g, j}
 C) {e, f}, {e, g}, {e, j}, {f, j}, {e, f, g}, {e, f, j}, {e, g, j}, {f, g, j}, {e, f, g, j}
 D) {e, f}, {e, g}, {e, j}, {f, g}, {f, j}, {g, j}, {e, f, g}, {e, f, j}, {e, g, j}, {f, g, j}, {e, f, g, j}
 Answer: D

- 134) An adventure travel company has reservations from four people (Lee, Maria, Nancy, and Pablo) for its white water rafting trip on June 1st. However the company knows that any of these people may fail to show up on the day of the trip. Denoting these four people by l, m, n, p, list all possibilities for the group of people who show up on June 1st for the rafting trip (ie list all possible subsets of {l, m, n, p}). 134) _____
 A) {l}, {m}, {n}, {p}, {l, m}, {l, n}, {l, p}, {m, n}, {m, p}, {n, p}, {l, m, n}, {l, m, p}, {l, n, p}, {m, n, p}, {m, n, l}, {l, m, n, p}
 B) $\emptyset$, {l}, {m}, {n}, {p}, {l, m}, {l, n}, {m, n}, {m, p}, {n, p}, {l, m, n}, {l, m, p}, {l, n, p}, {m, n, p}
 C) $\emptyset$, {l}, {m}, {n}, {p}, {l, m}, {l, n}, {l, p}, {m, n}, {m, p}, {n, p}, {l, m, n}, {l, m, p}, {l, n, p}, {m, n, p}, {l, m, n, p}
 D) {l}, {m}, {n}, {p}, {l, m}, {l, n}, {l, p}, {m, n}, {m, p}, {n, p}, {l, m, n}, {l, m, p}, {l, n, p}, {m, n, p}, {l, m, n, p}
 Answer: C

- 135) A committee is to be formed. Possible candidates for the committee are Anne, Daniel, Raul, Sarah, and Teresa. Denoting these five people by a, d, r, s, t, list all possible committees of three people (ie list all possible subsets of size three). 135) _____
- A) {a, d, r}, {a, d, s}, {a, d, t}, {a, r, s}, {a, r, t}, {a, s, t}, {d, r, s}, {d, r, t}, {d, s, t}, {r, s, t}, {d, a, r}, {s, t, d}
- B) {a, d, r}, {a, d, s}, {a, d, t}, {a, r, s}, {a, r, t}, {a, s, t}, {d, r, t}, {d, s, t}, {r, s, t}
- C) {a, d, r}, {a, d, s}, {a, d, t}, {a, r, s}, {d, r, s}, {d, r, t}, {d, s, t}, {r, s, t}
- D) {a, d, r}, {a, d, s}, {a, d, t}, {a, r, s}, {a, r, t}, {a, s, t}, {d, r, s}, {d, r, t}, {d, s, t}, {r, s, t}

Answer: D

List the elements in the set .

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

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

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

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

- 136) $A \cup C$ 136) _____
- A) {q, s, u, v, w, x, y, z} B) {q, s, u, w, y, v, w, x, y, z}
- C) {w, y} D) {q, s, u, v, w, y, z}

Answer: A

- 137) $B \cap C$ 137) _____
- A) {y, z} B) {y}
- C) {w, y, z} D) {q, s, v, w, x, y, z}

Answer: A

- 138) $A \cap B'$ 138) _____
- A) {r, s, t, u, v, w, x, z} B) {u, w}
- C) {q, s, t, u, v, w, x, y} D) {t, v, x}

Answer: B

- 139) $(A \cup B)'$ 139) _____
- A) {s, u, w} B) {t, v, x}
- C) {r, t, v, x} D) {r, s, t, u, v, w, x, z}

Answer: C

- 140) $(A \cap B)'$ 140) _____
- A) {s, u, w} B) {q, s, t, u, v, w, x, y}
- C) {t, v, x} D) {r, t, u, v, w, x, z}

Answer: D

- 141) $A' \cup B$ 141) _____
- A) {s, u, w} B) {q, s, t, u, v, w, x, y}
- C) {q, r, s, t, v, x, y, z} D) {r, s, t, u, v, w, x, z}

Answer: C

- 142) $C' \cup A'$ 142) _____
- A) {w, y} B) {q, r, s, t, u, v, x, z}
- C) {q, s, u, v, w, x, y, z} D) {s, t}

Answer: B

- 143) $C' \cap A'$ _____
 A) {q, s, u, v, w, x, y, z} B) {r, t}
 C) {w, y} D) {q, r, s, t, u, v, x, z}
 Answer: B
- 144) $C - A$ _____
 A) {v, x, z} B) {q, s, u, v, x, z} C) {w, y} D) {q, s, u}
 Answer: A
- 145) $A' - C$ _____
 A) {v, x, z} B) {r, t} C) {q, s, u, v, x, z} D) {q, s, u}
 Answer: B
- 146) $A \cup (B \cap C)$ _____
 A) {q, s, u, w, y, z} B) {q, y, z} C) {q, r, w, y, z} D) {q, w, y}
 Answer: A
- 147) $A \cap (B \cup C)$ _____
 A) {q, s, u, w, y, z} B) {q, y, z} C) {q, s, w, y} D) {q, r, w, y, z}
 Answer: C
- 148) $(A' \cup C) \cap B'$ _____
 A) {r, t, v, w, x} B) {v, x}
 C) {r, t, u, v, w, s, y, z} D) {y, z}
 Answer: A
- 149) $(B' \cap C)' \cup A$ _____
 A) {q, s, u, v, w, x, y} B) {q, s, u, y}
 C) {q, r, s, t, u, v, w, x, y} D) {q, r, s, t, u, w, y, z}
 Answer: D
- 150) $(A \cup B')' \cap C'$ _____
 A) {q, r, s, t, u, z} B) $\emptyset$ C) {q, r, s, t, u} D) {v, w, x, y}
 Answer: B
- 151) $B \cap (A - C)$ _____
 A) {q, s, u, y, z} B) {q, s}
 C) {q, s, u, y} D) {q, r, s, t, u, v, w, x, y}
 Answer: B
- 152) $(A \cap B') \cup (B \cap A')$ _____
 A) {q, s, u, w, y, z} B) {q, s, y} C) {u, w, z} D) {u, w, y, z}
 Answer: C

Let $U = \{\text{all soda pops}\}$, $A = \{\text{all diet soda pops}\}$, $B = \{\text{all cola soda pops}\}$, $C = \{\text{all soda pops in cans}\}$, and $D = \{\text{all caffeine-free soda pops}\}$. Describe the set in words.

- 153) $A \cap B$ _____
 A) All diet cola soda pops B) All diet or all cola soda pops
 C) All diet and all cola soda pops D) All soda pops
 Answer: A

- 154) $A' \cap C$ 154) _____
 A) All non-diet soda pops and all soda pops in cans
 B) All diet soda pops and all soda pops in cans
 C) All diet soda pops in cans
 D) All non-diet soda pops in cans
 Answer: D
- 155) $A \cap B \cap D$ 155) _____
 A) All diet, caffeine-free cola pops in cans
 B) All diet and all cola and all caffeine-free soda pops
 C) All soda pops not in cans
 D) All diet, caffeine-free cola soda pops
 Answer: D
- 156) $(A \cup B) \cup D$ 156) _____
 A) All soda pops
 B) All soda pops not in cans
 C) All diet, caffeine-free cola soda pops
 D) All diet or all cola or all caffeine-free soda pops
 Answer: D
- 157) $(A \cap B) \cap C'$ 157) _____
 A) All cola soda pops not in cans
 B) All diet cola soda pops not in cans
 C) All non-diet, non-cola soda pops not in cans
 D) All diet and all cola soda pops not in cans
 Answer: B
- 158) $(A \cup D) \cap C'$ 158) _____
 A) All diet soda pops not in cans or all caffeine-free soda pops not in cans
 B) All non-cola soda pops not in cans
 C) All non-diet, non-caffeine-free soda pops not in cans
 D) All diet, caffeine-free soda pops not in cans
 Answer: A
- 159) $(A' \cap B') \cup C$ 159) _____
 A) All non-diet soda pops and all non-cola soda pops in cans
 B) All non-diet non-cola soda pops in cans
 C) All non-diet non-cola soda pops and all soda pops not in cans
 D) All non-diet non-cola soda pops or all soda pops in cans
 Answer: D
- 160) $(A - D) \cap B$ 160) _____
 A) All non-diet, caffeine-free cola soda pops
 B) All diet soda pops that contain caffeine and all cola soda pops
 C) All diet cola soda pops that contain caffeine
 D) All diet caffeine-free cola soda pops
 Answer: C

161) $(B \cap C') \cup (C \cap B')$

161) _____

- A) All cola soda pops and all soda pops in cans
 B) All non-cola soda pops not in cans
 C) All cola soda pops not in cans or all non-cola soda pops in cans
 D) All cola soda pops in cans and all non-cola soda pops not in cans

Answer: C

The lists below show five agricultural crops in Alabama, Arkansas, and Louisiana.

<u>Alabama</u>	<u>Arkansas</u>	<u>Louisiana</u>
soybeans (s)	soybeans (s)	soybeans (s)
peanuts (p)	rice (r)	sugarcane (n)
corn (c)	cotton (t)	rice (r)
hay (h)	hay (h)	corn (c)
wheat (w)	wheat (w)	cotton (t)

Let U be the smallest possible universal set that includes all of the crops listed, and let A, K and L be the sets of five crops in Alabama, Arkansas, and Louisiana, respectively. Find each of the following sets.

162) $A \cap K$

162) _____

- A) {c, h, p, r, s, t, w} B) {c, p, r, t}
 C) {h, s, w} D) {c, h, s, t, w}

Answer: C

163) $L \cap K$

163) _____

- A) {c, h, n, r, s, t, w} B) {c, n, r, s, t}
 C) {c, h, n, w} D) {r, s, t}

Answer: D

164) $K' \cap L$

164) _____

- A) {h, w} B) {r, s, t} C) {c, n, p} D) {c, n}

Answer: D

165) $L' \cap A$

165) _____

- A) {n, r, t} B) {c, s} C) {h, p, w} D) {h, n, t, w}

Answer: C

166) $A' \cap K'$

166) _____

- A) {n} B) {c, p, r, t} C) {c, n, p, r, t} D) $\emptyset$

Answer: A

167) $A \cap K \cap L$

167) _____

- A) {n, p, s} B) {s}
 C) {c, h, n, p, r, s, t, w} D) {n, p}

Answer: B

168) $A \cup L$

168) _____

- A) {h, n, p, r, t, w} B) {c, s}
 C) {c, n, p} D) {c, h, n, p, r, s, t, w}

Answer: D

169) $K \cup L$ 169) _____
 A) {c, h, n, w} B) {r, s, t}
 C) {c, h, n, r, s, t, w} D) {n, r, t}
 Answer: C

170) $A' \cup L$ 170) _____
 A) {c, n, r, s, t} B) {h, n, p, r, t, w} C) {h, p, w} D) {n, r, t}
 Answer: A

171) $L' \cup K'$ 171) _____
 A) {r, s, t} B) {c, h, n, p, w} C) {c, h, p, s, w} D) {p}
 Answer: B

Let A and B be sets with cardinal numbers, $n(A) = a$ and $n(B) = b$, respectively. Decide whether the statement is true or false.

172) $n(A \cup B) = n(A) - n(B)$ 172) _____
 A) True B) False
 Answer: B

173) $n(A - B) = n(B - A)$ 173) _____
 A) True B) False
 Answer: B

174) If $B \subseteq A$, $n(B) = n(A - B)$. 174) _____
 A) True B) False
 Answer: B

175) If $B \subseteq A$, $n(B) = n(A) - n(A - B)$. 175) _____
 A) True B) False
 Answer: A

176) $n(A \cap B) = n(B \cap A)$ 176) _____
 A) True B) False
 Answer: A

177) $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ 177) _____
 A) True B) False
 Answer: A

178) $n(A \cap B) = n(A) - n(B)$ 178) _____
 A) True B) False
 Answer: B

179) $n(A \cup B) + n(A \cap B) = n(A) + n(B)$ 179) _____
 A) True B) False
 Answer: A

Tell whether the statement is true or false.

180) $\{3, 6, 11\} = \{0, 3, 6, 11\}$

A) True

Answer: B

B) False

180) _____

181) $\{54, 55, 54, 55\} = \{54, 55\}$

A) True

Answer: A

B) False

181) _____

182) $\{4, 17, 23, 10, 36\} = \{36, 17, 10, 32, 4\}$

A) True

Answer: B

B) False

182) _____

183) $(11, 7) = (7, 11)$

A) True

Answer: B

B) False

183) _____

184) $(12 - 8, 16 - 11) = (4, 5)$

A) True

Answer: A

B) False

184) _____

185) $(9 + 17, 15 + 17) = (9, 15)$

A) True

Answer: B

B) False

185) _____

186) $\{(3, 1), (0, 6), (-4, -2)\} = \{(-4, -2), (3, 1), (6, 0)\}$

A) True

Answer: B

B) False

186) _____

Find the Cartesian product.

187) $A = \{5, 15, 2\}$

$B = \{6, 10\}$

Find $A \times B$.

A) $\{(5, 6), (15, 10)\}$

B) $\{(5, 6), (5, 10), (15, 6), (15, 10), (2, 6), (2, 10)\}$

C) $\{(6, 5), (6, 15), (6, 2), (10, 5), (10, 15), (10, 2)\}$

D) $\{(5, 6), (15, 2), (2, 6)\}$

Answer: B

187) _____

188) $A = \{i, a\}$

$B = \{t, d, m\}$

Find $A \times B$.

A) $\{(i, t), (t, a), (i, d), (d, a), (i, m), (m, a)\}$

C) $\{(i, t), (i, d), (i, m), (a, t), (a, d), (a, m)\}$

Answer: C

B) $\{(i, t), (a, t), (i, d), (a, d)\}$

D) $\{(t, i), (t, a), (d, i), (d, a), (m, i), (m, a)\}$

188) _____

- 189) $A = \{0\}$ 189) _____
 $B = \{20, 30, 40\}$
Find $B \times A$.
A) $\{0, 0, 0\}$ B) $\{(20, 0), (30, 0), (40, 0)\}$
C) $\{(0, 20), (0, 30), (0, 40)\}$ D) $\{0\}$
Answer: B
- 190) $A = \{2, 4, 7, 6\}$ 190) _____
 $B = \{0, 1\}$
Find $B \times A$.
A) $\{(0, 2), (0, 4), (0, 7), (0, 6), (1, 2), (1, 4), (1, 7), (1, 6)\}$
B) $\{(2, 0), (2, 1), (4, 0), (4, 1)\}$
C) $\{(2, 0), (4, 0), (7, 0), (6, 0), (2, 1), (4, 1), (7, 1), (6, 1)\}$
D) $\{0, 1, 2, 4, 7, 6\}$
Answer: A
- Find the indicated cardinal number.
- 191) Find $n(A \times B)$ given that $A = \{2\}$ and $B = \{1, 3\}$. 191) _____
A) 1 B) 2 C) 3 D) 4
Answer: B
- 192) Find $n(A \times C)$ given that $A = \{2\}$ and $C = \{4, 5, 6\}$. 192) _____
A) 4 B) 3 C) 2 D) 1
Answer: B
- 193) Find $n(D \times B)$ given that $B = \{1, 3\}$ and $D = \{7, 8, 9, 10\}$. 193) _____
A) 12 B) 16 C) 7 D) 8
Answer: D
- 194) Find $n(C \times D)$ given that $C = \{4, 5, 6\}$ and $D = \{7, 8, 9, 10\}$. 194) _____
A) 27 B) 12 C) 81 D) 7
Answer: B
- 195) Find $n(E)$, given that $n(C \times E) = 18$ and $C = \{4, 5, 6\}$. 195) _____
A) 54 B) 9 C) 6 D) 3
Answer: C
- 196) Find $n(F)$, given that $n(B \times F) = 18$ and $B = \{1, 3\}$. 196) _____
A) 6 B) 54 C) 9 D) 36
Answer: C
- 197) Find $n(G)$, given that $n(D \times G) = 20$ and $D = \{7, 8, 9, 10\}$. 197) _____
A) 9 B) 4 C) 24 D) 5
Answer: D
- 198) Find $n(A \times B)$ given that $n(A) = 34$ and $n(B) = 10$. 198) _____
A) 54 B) 340 C) 44 D) 24
Answer: B

199) Find $n(B)$ given that $n(A \times B) = 90$ and $n(A) = 9$.

A) 9

B) 81

C) 99

D) 10

199) _____

Answer: D

200) Find $n(A)$ given that $n(A \times B) = 36$ and $n(B) = 3$.

A) 12

B) 3

C) 39

D) 33

200) _____

Answer: A

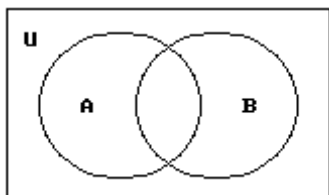
For the given sets, construct a Venn diagram and place the elements in the proper region.

201) Let $U = \{c, d, g, h, k, u, q\}$

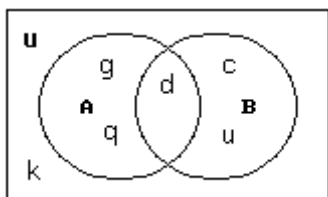
$A = \{d, h, g, q\}$

$B = \{c, d, h, u\}$

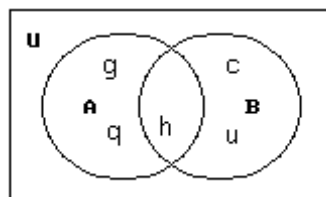
201) _____



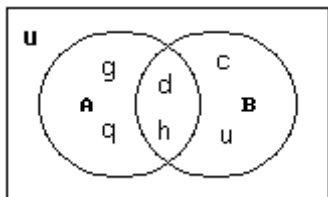
A)



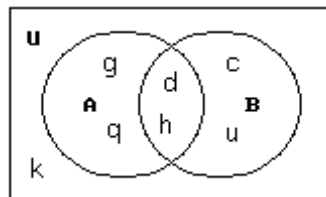
B)



C)



D)



Answer: D

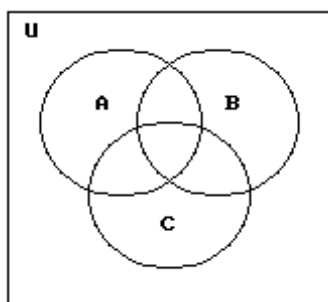
202) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$

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

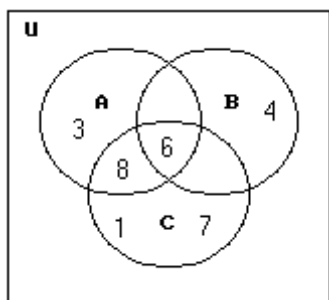
$B = \{4, 6\}$

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

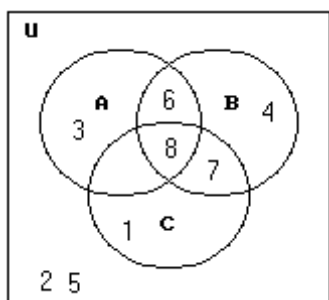
202) _____



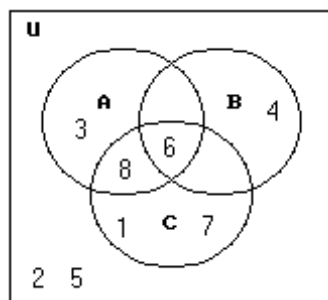
A)



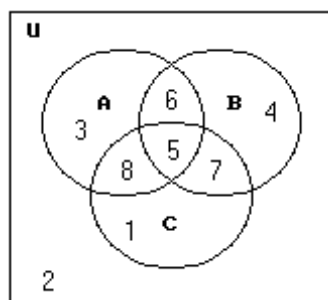
C)



B)



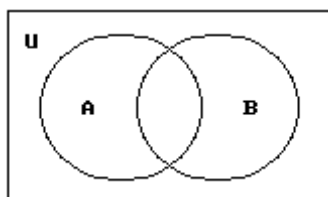
D)



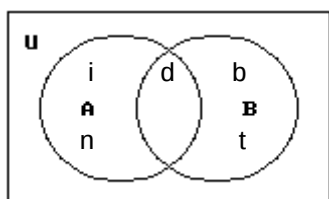
Answer: B

- 203) Let $U = \{b, d, j, i, m, n, t\}$
 $A = \{d, j, i, n\}$
 $B = \{b, d, j, t\}$

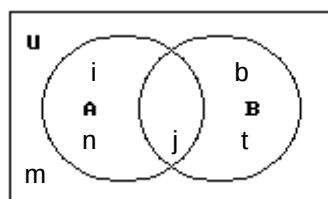
203) _____



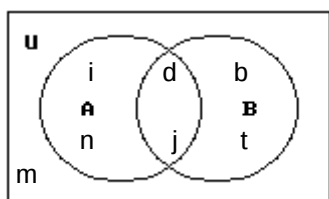
A)



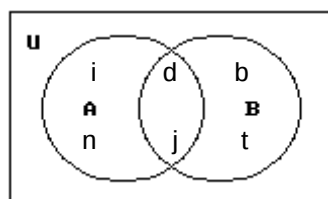
B)



C)



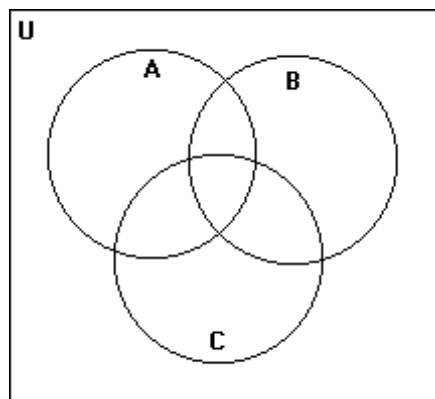
D)

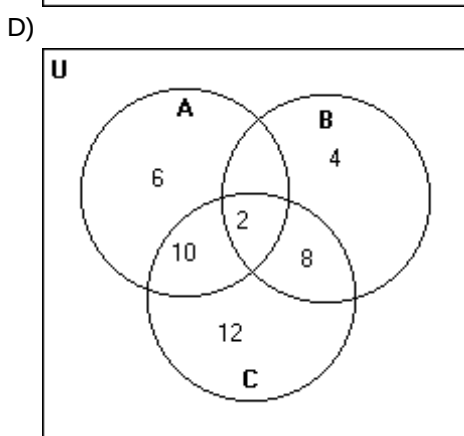
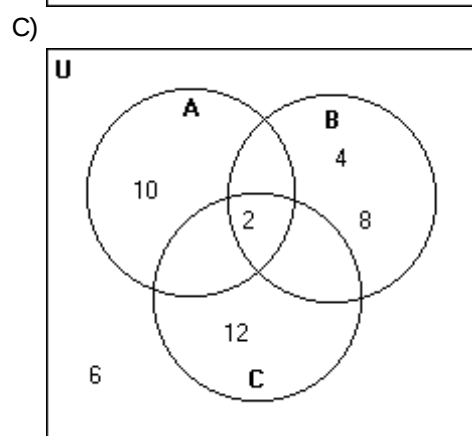
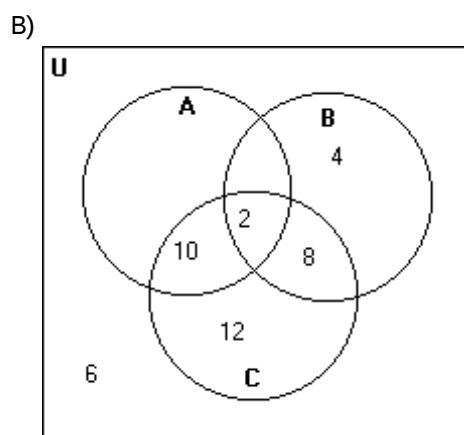
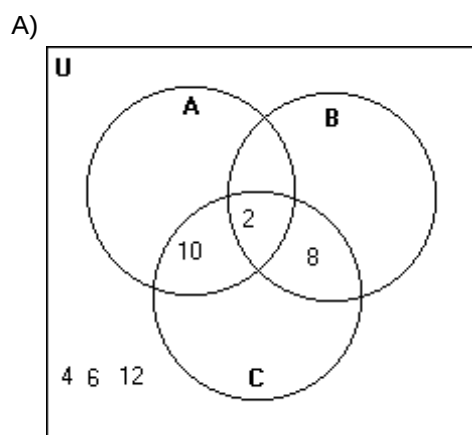


Answer: C

- 204) $U = \{2, 4, 6, 8, 10, 12\}$
 $A = \{2, 6, 10\}$
 $B = \{2, 4, 8\}$
 $C = \{2, 8, 10, 12\}$

204) _____

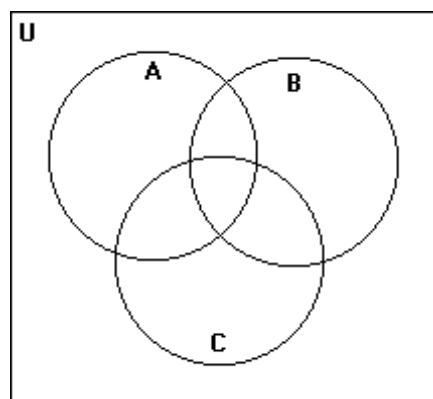


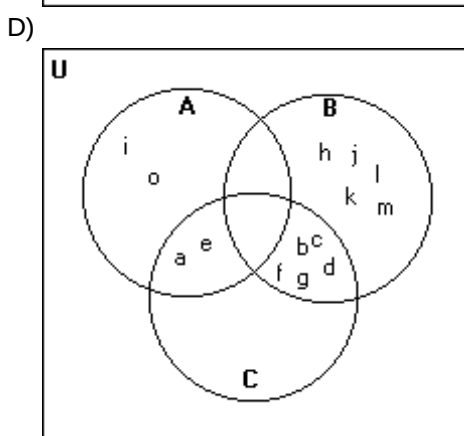
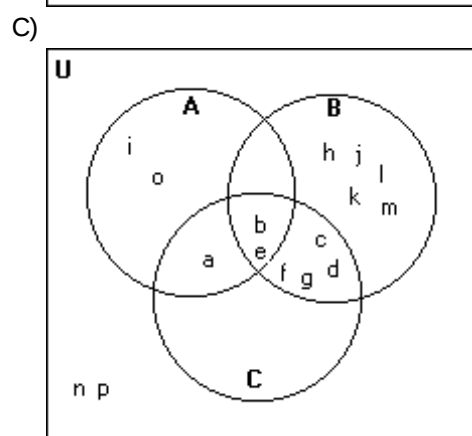
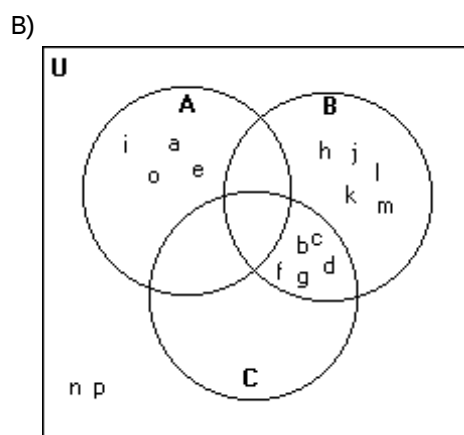
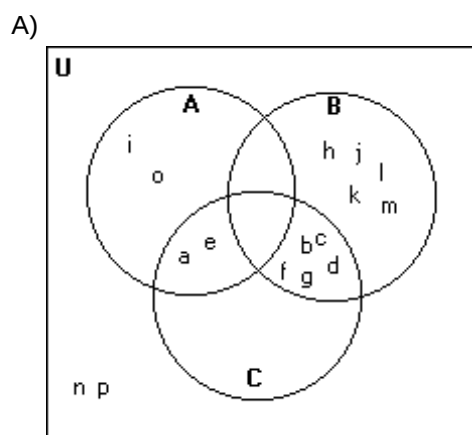


Answer: D

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

205) _____



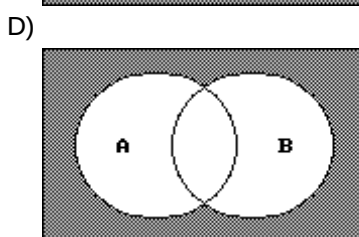
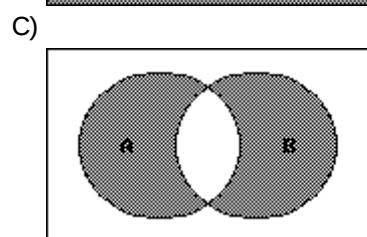
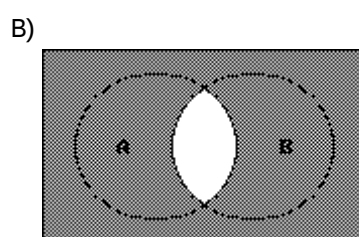
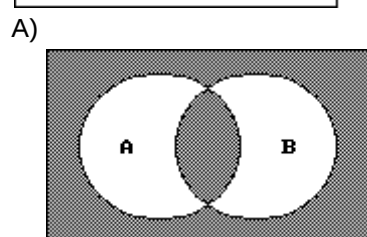
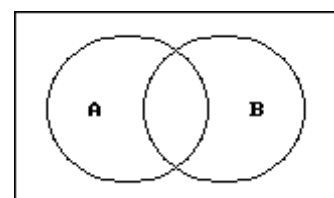


Answer: A

Shade the regions representing the set.

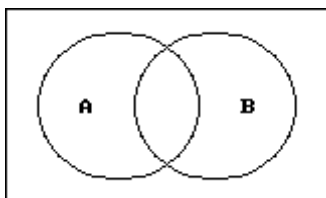
206) $A' \cap B'$

206) _____

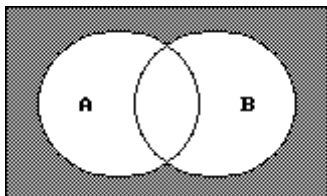


Answer: D

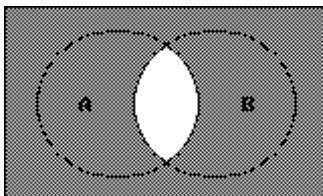
207) $A' \cup B'$



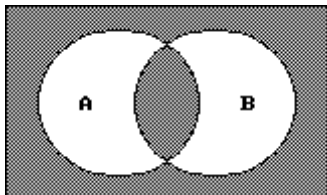
A)



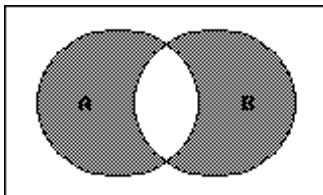
B)



C)

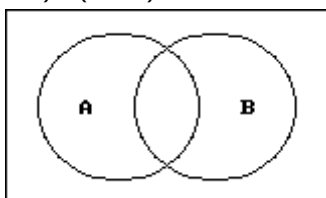


D)

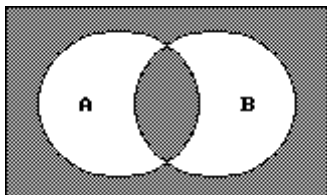


Answer: B

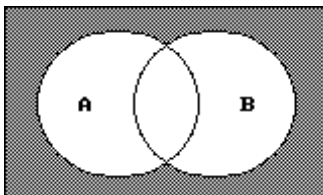
208) $(A \cup B) \cap (A \cap B)'$



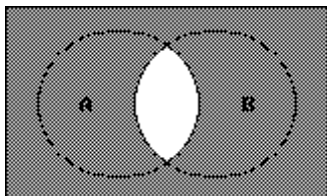
A)



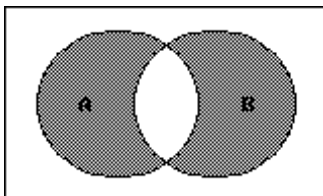
B)



C)



D)



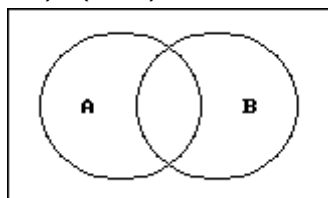
Answer: D

207) _____

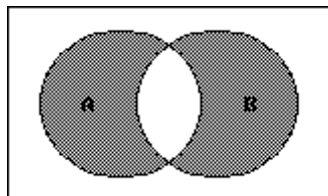
208) _____

209) $(A \cap B) \cup (A \cup B)'$

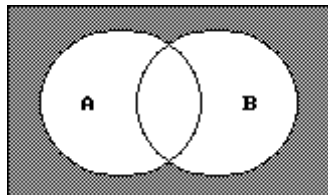
209) _____



A)

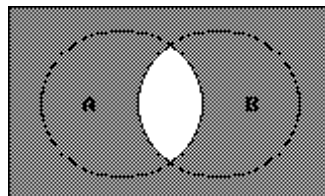


C)

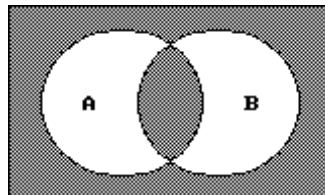


Answer: D

B)

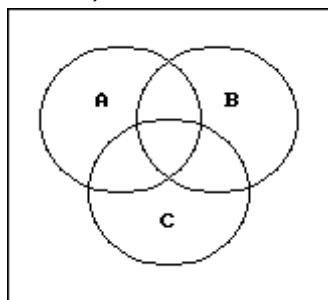


D)

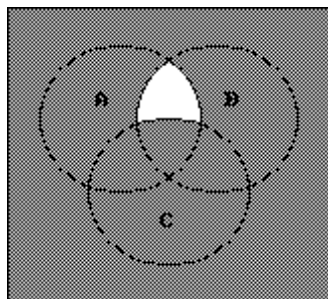


210) $(A \cap B \cap C)'$

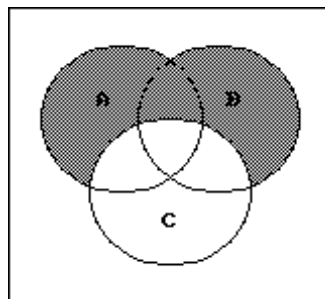
210) _____



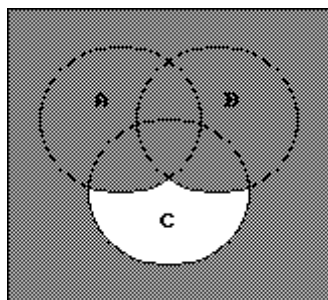
A)



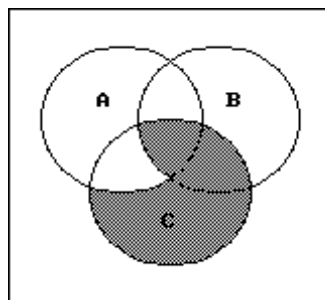
B)



C)



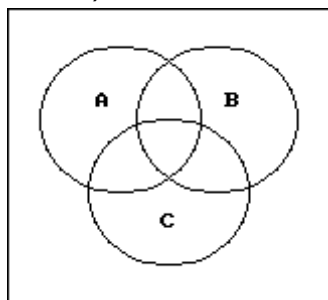
D)



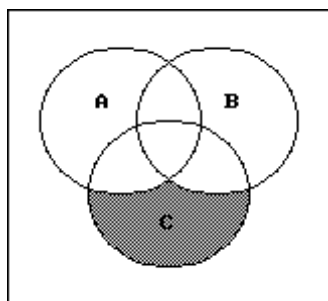
Answer: A

211) $(A \cup B \cup C)'$

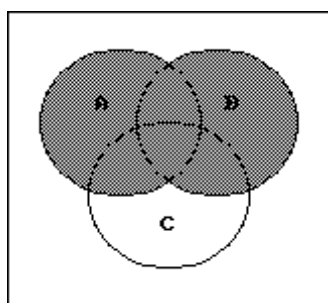
211) _____



A)

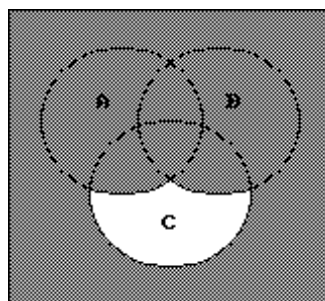


C)

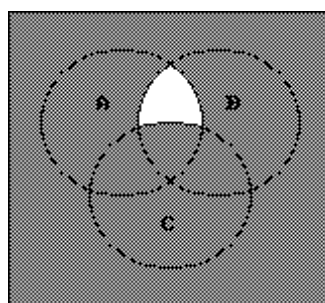


Answer: A

B)

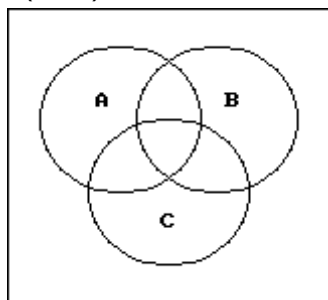


D)

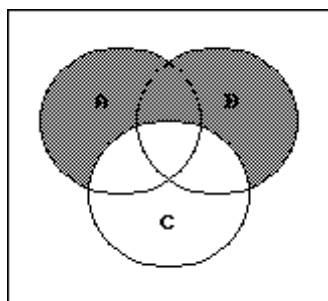


212) $C' \cap (A \cup B)$

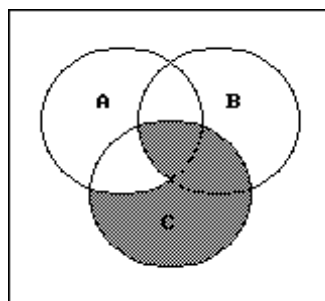
212) _____



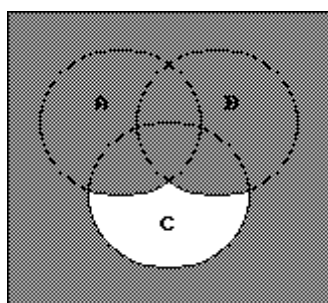
A)



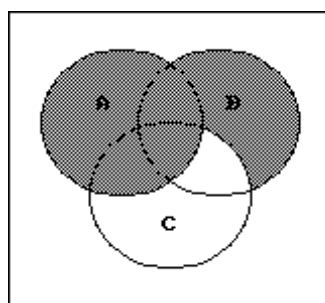
B)



C)



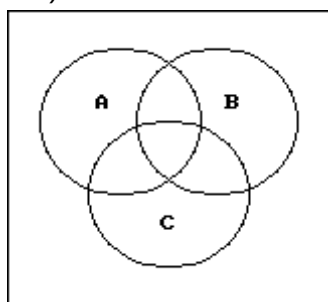
D)



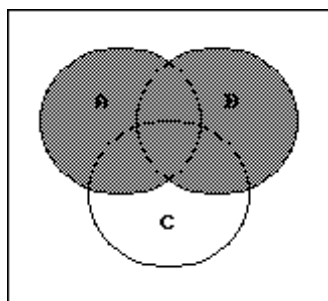
Answer: A

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

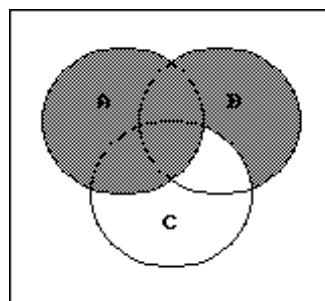
213) _____



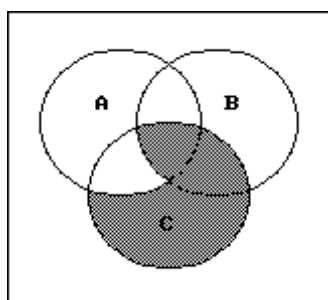
A)



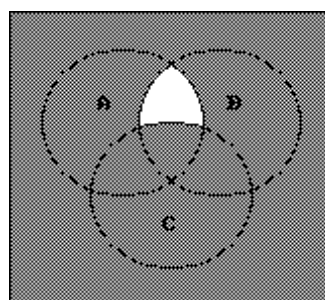
B)



C)



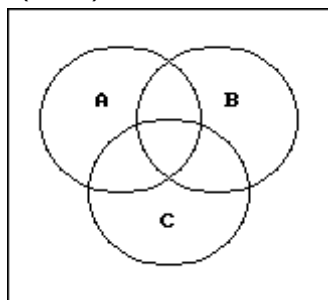
D)



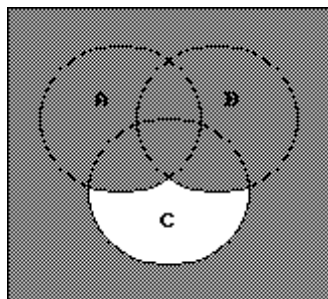
Answer: C

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

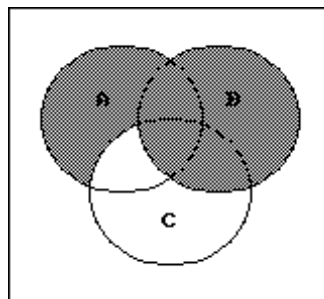
214) _____



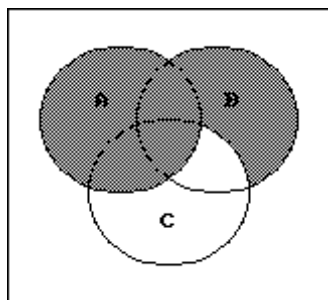
A)



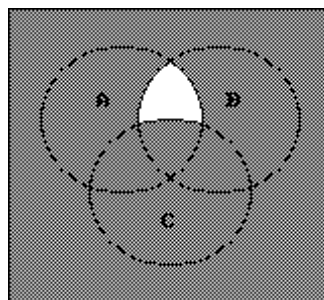
B)



C)



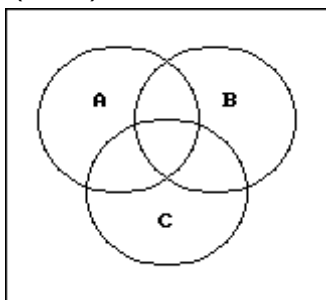
D)



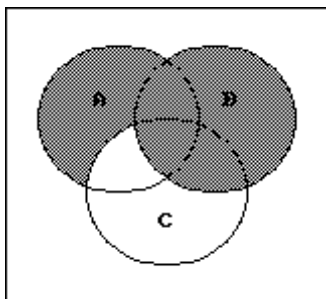
Answer: C

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

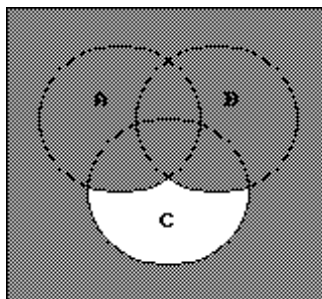
215) _____



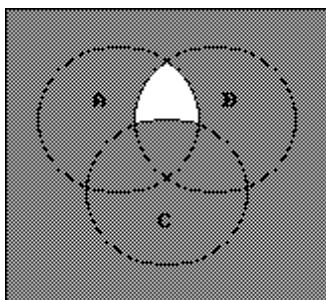
A)



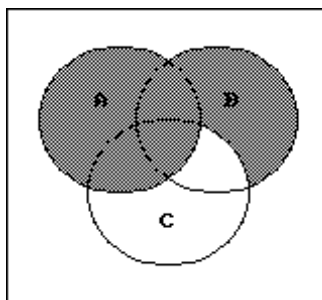
B)



C)



D)

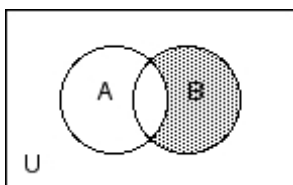


Answer: A

Write a description of the shaded region using the symbols A , B , C , $\cup$, $\cap$, $-$, and $'$ as needed.

216)

216) _____



A) $A \cap B'$

B) $B - A'$

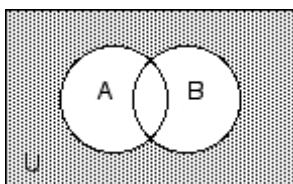
C) $B \cap A'$

D) $A - B$

Answer: C

217)

217) _____



A) $A \cup B$

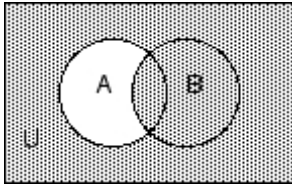
B) $A - B$

C) $(A \cap B)'$

D) $A' \cap B'$

Answer: D

218)



A) $A' \cup B$

B) $A' \cap B$

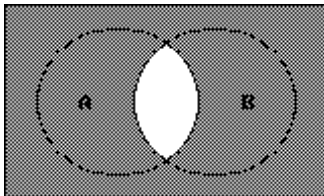
C) $(A \cap B)'$

D) $B - A$

Answer: A

218) _____

219)



A) $(A \cup B)'$

B) $A' \cap B'$

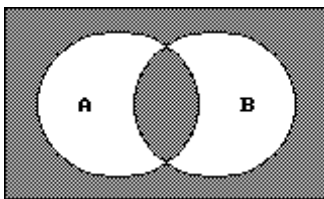
C) $A \cap B$

D) $(A \cap B)'$

Answer: D

219) _____

220)



A) $A' \cap B'$

C) $(A - B) \cup (B - A)$

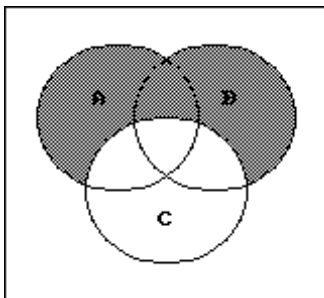
B) $(A \cap B) \cup (A \cap B)'$

D) $(A \cap B) \cup (A \cup B)'$

Answer: D

220) _____

221)



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

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

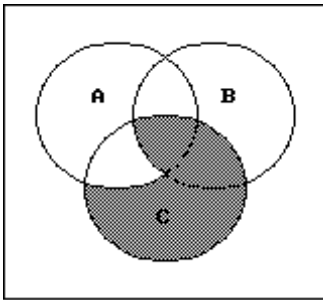
C) $(A \cup B) \cap C$

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

Answer: D

221) _____

222)



A) $A' \cap C$

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

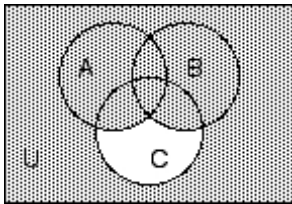
C) $(A' \cap B) \cup C$

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

Answer: D

222) _____

223)



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

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

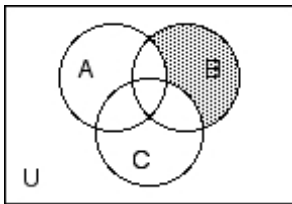
C) $A \cup B \cap C'$

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

Answer: A

223) _____

224)



A) $B - (A \cap C)$

B) $(B - A) \cup C$

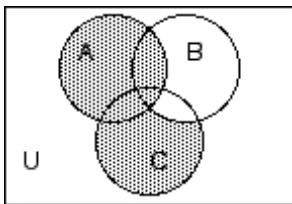
C) $B \cap (A \cap C)'$

D) $A' \cap C' \cap B$

Answer: D

224) _____

225)



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

B) $A \cup C$

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

D) $A \cup C - B$

Answer: A

225) _____

Decide whether the given statement is always true or not always true.

226) $A \cap A' = \emptyset$

A) Always true

B) Not always true

Answer: A

226) _____

227) $(A \cup B) \subseteq A$

A) Always true

B) Not always true

Answer: B

227) _____

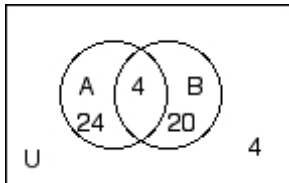
- 228) $(A \cap B) \subseteq B$ 228) _____
 A) Not always true B) Always true
 Answer: B
- 229) $(A \cap B)' = A' \cup B'$ 229) _____
 A) Always true B) Not always true
 Answer: A
- 230) $(A \cup B)' = A' \cup B'$ 230) _____
 A) Not always true B) Always true
 Answer: A
- 231) If $A \subseteq B$, then $A \cup B = A$ 231) _____
 A) Not always true B) Always true
 Answer: A
- 232) If $B \subseteq A$, then $A \cap B = A$ 232) _____
 A) Always true B) Not always true
 Answer: B
- 233) $A - A' = A$ 233) _____
 A) Not always true B) Always true
 Answer: B
- 234) $A \cup (B \cap C)' = A \cup (B' \cup C')$ 234) _____
 A) Not always true B) Always true
 Answer: B
- 235) $A \cap (B \cup C) = (A \cap B) \cup C$ 235) _____
 A) Not always true B) Always true
 Answer: A
- Describe the conditions under which the statement is true.
- 236) $A \cap B = A$ 236) _____
 A) $A \subseteq B$ B) Always true C) $B = \emptyset$ D) $B \subseteq A$
 Answer: A
- 237) $A \cup \emptyset = U$ 237) _____
 A) $A = \emptyset$ B) $A \neq \emptyset$ C) Always true D) $A = U$
 Answer: D
- 238) $A \cup B = B$ 238) _____
 A) $B \subseteq A$ B) $A \subseteq B$ C) Always true D) $A = \emptyset$
 Answer: B
- 239) $A \cap A' = A$ 239) _____
 A) $A = U$ B) Always true C) $A \neq \emptyset$ D) $A = \emptyset$
 Answer: D

240) $A \cap B' = A$ 240) _____
 A) $A \cap B = \emptyset$ B) $B \subseteq A$ C) Always true D) $B = \emptyset$
 Answer: A

241) $A \cup B = A$ 241) _____
 A) $B \subseteq A$ B) $B = \emptyset$ C) $A \subseteq B$ D) Always true
 Answer: A

Find the cardinal number of the set.

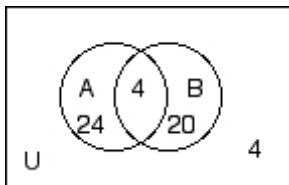
242) The numbers in the Venn Diagram below represent cardinalities. 242) _____



Find $n(A \cup B)$.

A) 4 B) 48 C) 52 D) 24
 Answer: B

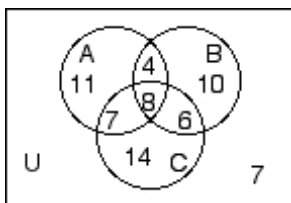
243) The numbers in the Venn Diagram below represent cardinalities. 243) _____



Find $n(A \cap B')$.

A) 24 B) 28 C) 4 D) 20
 Answer: A

244) The numbers in the Venn Diagram below represent cardinalities. 244) _____

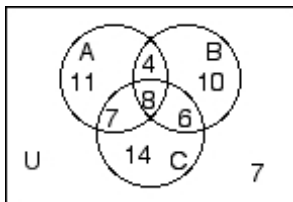


Find $n(A' \cap B' \cap C)$.

A) 14 B) 21 C) 27 D) 13
 Answer: A

245) The numbers in the Venn Diagram below represent cardinalities.

245) _____



Find $n(A \cap B' \cap C)$

A) 7

B) 11

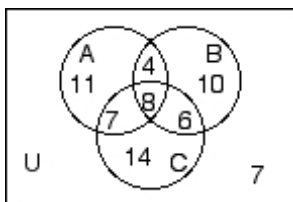
C) 15

D) 6

Answer: A

246) The numbers in the Venn Diagram below represent cardinalities.

246) _____



Find $n(B \cup C)$

A) 49

B) 14

C) 60

D) 42

Answer: A

247) Given: $n(U) = 60$

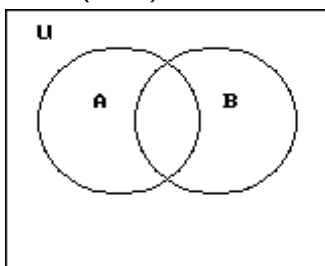
$n(A) = 35$

$n(B) = 20$

$n(A \cap B) = 4$

Find $n(A \cup B)'$.

247) _____



A) 51

B) 55

C) 9

D) 5

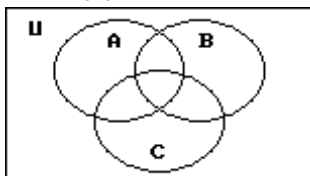
Answer: C

248) Given:

248) _____

$$\begin{aligned}n(U) &= 213 \\n(A) &= 72 \\n(B) &= 92 \\n(A \cap B) &= 31 \\n(A \cap C) &= 34 \\n(A \cap B \cap C) &= 16 \\n(A' \cap B \cap C') &= 45 \\n(A' \cap B' \cap C') &= 54\end{aligned}$$

Find $n(C)$.



A) 26

B) 76

C) 44

D) 42

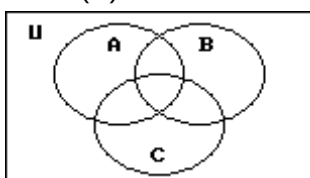
Answer: B

249) Given:

249) _____

$$\begin{aligned}n(A) &= 80 \\n(B) &= 88 \\n(C) &= 82 \\n(A \cap B) &= 16 \\n(A \cap C) &= 18 \\n(B \cap C) &= 12 \\n(A \cap B \cap C) &= 10 \\n(A' \cap B' \cap C') &= 161\end{aligned}$$

Find $n(U)$



A) 385

B) 375

C) 214

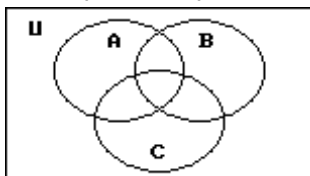
D) 294

Answer: B

250) Given: $n(A \cup B \cup C) = 69$
 $n(A \cap B \cap C) = 10$
 $n(A \cap B) = 22$
 $n(A \cap C) = 19$
 $n(B \cap C) = 17$
 $n(A) = 51$
 $n(B) = 34$
 $n(C) = 32$

250) _____

Find $n(A' \cap B \cap C)$



A) 6

B) 7

C) 8

D) 9

Answer: B

Find the cardinal number of the indicated set. Use the cardinal number formula.

251) If $n(A) = 7$, $n(B) = 15$ and $n(A \cap B) = 5$, what is $n(A \cup B)$?

251) _____

A) 16

B) 18

C) 22

D) 17

Answer: D

252) If $n(A) = 8$, $n(B) = 21$ and $n(A \cup B) = 25$, what is $n(A \cap B)$?

252) _____

A) 4

B) 12

C) 6

D) 2

Answer: A

253) If $n(B) = 60$, $n(A \cap B) = 11$, and $n(A \cup B) = 105$, find $n(A)$.

253) _____

A) 54

B) 56

C) 45

D) 58

Answer: B

254) If $n(A) = 20$, $n(A \cup B) = 58$, and $n(A \cap B) = 16$, find $n(B)$.

254) _____

A) 53

B) 38

C) 55

D) 54

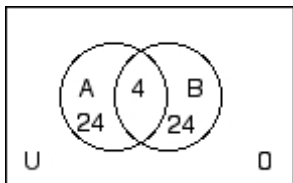
Answer: D

Draw an appropriate Venn diagram and use the given information to fill in the number of elements in each region.

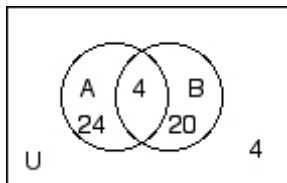
255) $n(U) = 52$, $n(A) = 28$, $n(A \cap B) = 4$, $n(B') = 28$

255) _____

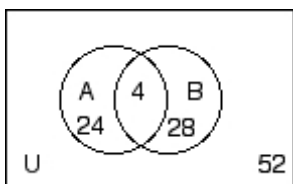
A)



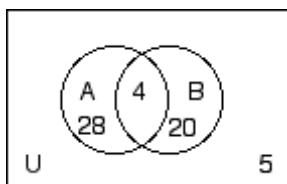
B)



C)



D)

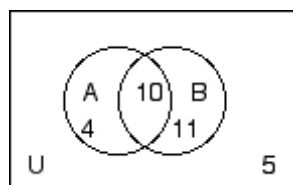


Answer: B

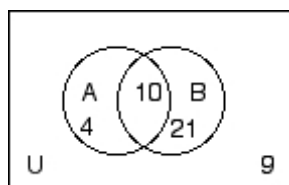
256) $n(A) = 14$, $n(B) = 21$, $n(A \cup B) = 25$, $n(B') = 9$

256) _____

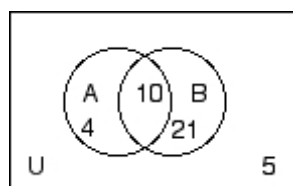
A)



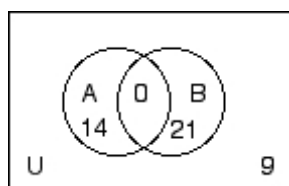
B)



C)



D)

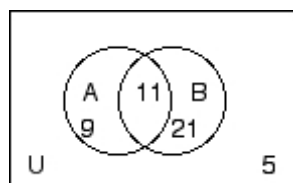


Answer: A

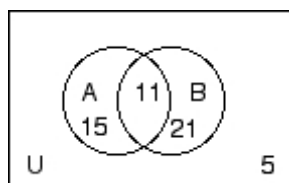
257) $n(A') = 26$, $n(B) = 32$, $n(A \cap B) = 11$, $n(A' \cup B') = 35$

257) _____

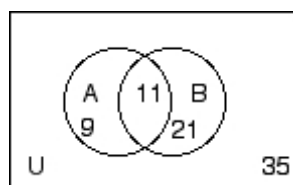
A)



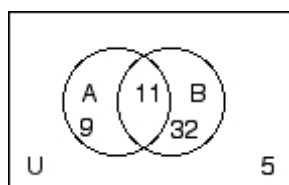
B)



C)



D)

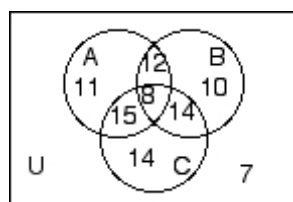


Answer: A

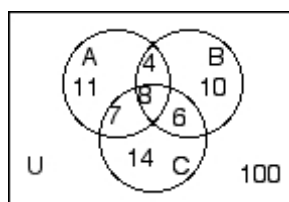
258) $n(A) = 30$, $n(B) = 28$, $n(C) = 35$, $n(A \cap B) = 12$, $n(A \cap C) = 15$, $n(B \cap C) = 14$, $n(U) = 67$

258) _____

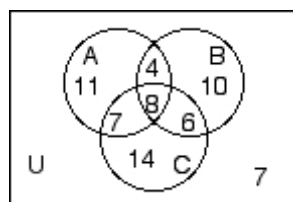
A)



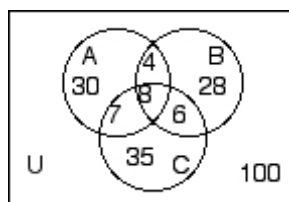
B)



C)



D)

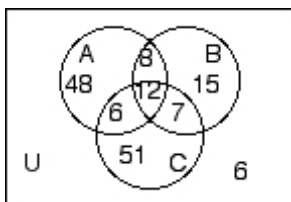


Answer: C

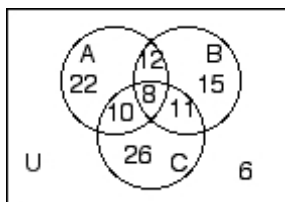
259) $n(A) = 48$, $n(B') = 60$, $n(C) = 51$, $n(A \cap B) = 20$, $n(B \cap C) = 19$, $n(A \cap C) = 18$,
 $n(A \cap B \cap C) = 12$, $n(A \cup B) = 70$

259) _____

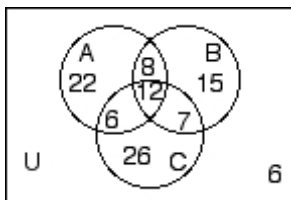
A)



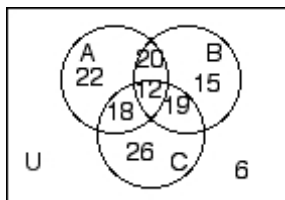
B)



C)



D)

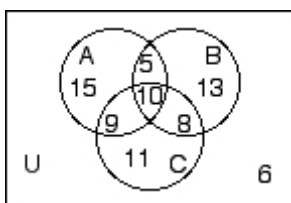


Answer: C

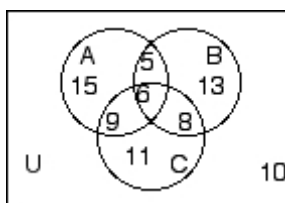
260) $n(A) = 35$, $n(A \cap B') = 24$, $n(A \cap C) = 15$, $n(B \cap C) = 14$, $n(A' \cap B' \cap C') = 10$, $n(A \cap B \cap C) = 6$,
 $n(B \cup C) = 52$, $n(B \cap C') = 18$

260) _____

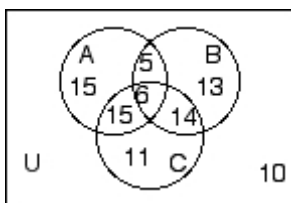
A)



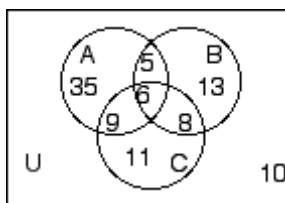
B)



C)



D)



Answer: B

Solve the problem.

261) 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 only a cat?

261) _____

A) 8

B) 18

C) 15

D) 3

Answer: D

262) 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?

262) _____

A) 400

B) 300

C) 100

D) 500

Answer: D

- 263) 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: 263) _____
- 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) 394 B) 364 C) 374 D) 384
- Answer: D
- 264) A survey of 280 families showed that 264) _____
- 107 had a dog;
 - 82 had a cat;
 - 37 had a dog and a cat;
 - 105 had neither a cat nor a dog nor a parakeet;
 - 9 had a cat, a dog, and a parakeet.
- How many had a parakeet only?
- A) 33 B) 38 C) 28 D) 23
- Answer: D
- 265) A survey of a group of 112 tourists was taken in St. Louis. The survey showed the following: 265) _____
- 63 of the tourists plan to visit Gateway Arch;
 - 44 plan to visit the zoo;
 - 9 plan to visit the Art Museum and the zoo, but not the gateway Arch;
 - 14 plan to visit the Art Museum and the Gateway Arch, but not the zoo;
 - 16 plan to visit the Gateway Arch and the zoo, but not the Art Museum;
 - 7 plan to visit the Art Museum, the zoo, and the Gateway Arch;
 - 14 plan to visit none of the three places.
- How many plan to visit the Art Museum only?
- A) 14 B) 32 C) 98 D) 44
- Answer: A

- 266) In a survey of 280 people, a travel company asked people about places they plan to visit in the next 5 years. The results were as follows: 266) _____
- 48 plan to visit Europe
 - 58 plan to visit Latin America
 - 34 plan to visit Asia
 - 14 plan to visit Europe and Latin America
 - 12 plan to visit Latin America and Asia
 - 11 plan to visit Europe and Asia
 - 4 plan to visit all three

How many people plan to visit exactly two of these places?

- A) 25 B) 37 C) 18 D) 29

Answer: A

- 267) A survey of 134 college students was done to find out what elective courses they were taking. Let A = the set of those taking art, B = the set of those taking basketweaving, and C = the set of those taking canoeing. The study revealed the following information. 267) _____

$$n(A) = 45 \quad n(A \cap B) = 12$$

$$n(B) = 55 \quad n(A \cap C) = 15$$

$$n(C) = 40 \quad n(B \cap C) = 23$$

$$n(A \cap B \cap C) = 2$$

How many students were not taking any of these electives?

- A) 52 B) 10 C) 44 D) 42

Answer: D

Decide whether or not it is possible to set up a one-to-one correspondence between the elements of the sets.

- 268) $\{3, 4, 8, 9\}$ and $\{-3, 4, -8, 9\}$ 268) _____
- A) Not possible B) Possible

Answer: B

- 269) $\{0, 9, 12, 16\}$ and $\{9, 12, 16\}$ 269) _____
- A) Possible B) Not possible

Answer: B

- 270) $\{\text{Mon, Tue, Wed}\}$ and $\{\text{Oct, Nov, Dec}\}$ 270) _____
- A) Not possible B) Possible

Answer: B

- 271) $\emptyset$ and $\{69\}$ 271) _____
- A) Not possible B) Possible

Answer: A

- 272) $\{0, 0.5, 0.25, 0.2\}$ and $\left\{\frac{1}{2}, \frac{1}{4}, \frac{1}{5}\right\}$ 272) _____

- A) Not possible B) Possible

Answer: A

273) {a, b, c, d} and {A, B, C, D}

A) Possible

B) Not possible

273) _____

Answer: A

274) {0} and {856}

A) Possible

B) Not possible

274) _____

Answer: A

275) {1, 2, 3, 4, ...} and {0, 1, 2, 3, 4}

A) Possible

B) Not possible

275) _____

Answer: B

Find the cardinal number of the set.

276) {8, 9, 10, 11, ...}

A) $\aleph_0$

B) c

C) 4

D) 11

276) _____

Answer: A

277) {6, 6, 7, 7, 8, 8, ..., 12, 12}

A) 14

B) $\aleph_0$

C) 7

D) 4

277) _____

Answer: C

278) $\left\{\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{256}, \dots\right\}$

A) 4

B) c

C) 16

D) $\aleph_0$

278) _____

Answer: D

279) {m, i, s, s, i, s, s, i, p, p, i}

A) 8

B) 5

C) 11

D) 4

279) _____

Answer: D

280) {x | x is a decimal between 63 and 64}

A) 2 $\aleph_0$

B) 2

C) $\aleph_0$

D) c

280) _____

Answer: D

281) {The set of points on a straight line}

A) $\aleph_0$

B) c

C) 1

D) 0

281) _____

Answer: B

282) {Monday, Tuesday, ..., Saturday}

A) 7

B) 3

C) 4

D) 6

282) _____

Answer: D

283) {x | x is an even integer number smaller than 100}

A) 99

B) 49

C) $\aleph_0$

D) c

283) _____

Answer: C

- 284) $\{x \mid x \text{ is a real number between } 1.1 \text{ and } 1.2\}$ 284) _____
 A) c B) $\aleph_0$ C) 10 D) 0
 Answer: A
- 285) $\{-4, -8, -12, -16, \dots\}$ 285) _____
 A) $\aleph_0$ B) 100 C) 4 D) c
 Answer: A
- Determine whether the sets are equal, equivalent, both, or neither.
- 286) $\{72, 40, 27\}$ and $\{40, 27, 72\}$ 286) _____
 A) Neither B) Both C) Equal D) Equivalent
 Answer: B
- 287) $\{L, M, N, O\}$ and $\{l, m, n, o\}$ 287) _____
 A) Equivalent B) Both C) Equal D) Neither
 Answer: A
- 288) $\{x \mid x \text{ is a whole number}\}$ and $\{x \mid x \text{ is an integer}\}$ 288) _____
 A) Equivalent B) Both C) Equal D) Neither
 Answer: A
- 289) $\{\text{brake}\}$ and $\{\text{break}\}$ 289) _____
 A) Equivalent B) Both C) Neither D) Equal
 Answer: A
- 290) $\{4, 12\}$ and $\{41, 2\}$ 290) _____
 A) Neither B) Equivalent C) Both D) Equal
 Answer: B
- 291) $\{4, 12\}$ and $\{4, 1, 2\}$ 291) _____
 A) Neither B) Equivalent C) Equal D) Both
 Answer: A
- 292) $\{\text{first, second, third}\}$ and $\{1, 2, 3\}$ 292) _____
 A) Both B) Neither C) Equivalent D) Equal
 Answer: C
- 293) $\left\{\frac{1}{10}, \frac{2}{10}, \frac{3}{10}\right\}$ and $\{0.1, 0.2, 0.3\}$ 293) _____
 A) Neither B) Equivalent C) Both D) Equal
 Answer: C
- 294) $\{x \mid x \text{ is a real number}\}$ and $\{x \mid x \text{ is a rational number}\}$ 294) _____
 A) Equivalent B) Both C) Neither D) Equal
 Answer: C
- 295) $\{x \mid x \text{ is an even integer}\}$ and $\{x \mid x \text{ is an odd integer}\}$ 295) _____
 A) Both B) Equal C) Neither D) Equivalent
 Answer: D

Show that the set has cardinal number $\aleph_0$ by establishing a one-to-one correspondence between the set of counting numbers and the given set. Be sure to show the pairing of the general terms in the sets.

296) $\{4, 8, 12, 16, \dots\}$

A) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{4, & 8, & 12, & 16, & \dots, & 4n, & \dots\} \end{array}$$

C) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{4, & 8, & 12, & 16, & \dots, & 5n, & \dots\} \end{array}$$

Answer: A

B) $\{0, 1, 2, 3, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{4, & 8, & 12, & 16, & \dots, & 4n, & \dots\} \end{array}$$

D) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{4, & 8, & 12, & 16, & \dots, & n, & \dots\} \end{array}$$

296) _____

297) $\{0, 2, 4, 6, 8, \dots\}$

A) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{0, & 2, & 4, & 6, & \dots, & 2n + 2, & \dots\} \end{array}$$

C) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{0, & 2, & 4, & 6, & \dots, & 2n - 2, & \dots\} \end{array}$$

Answer: C

B) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{0, & 2, & 4, & 6, & \dots, & 2n - 1, & \dots\} \end{array}$$

D) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{0, & 2, & 4, & 6, & \dots, & 2n, & \dots\} \end{array}$$

297) _____

298) $\{3, 7, 11, 15, \dots\}$

A) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{3, & 7, & 11, & 15, & \dots, & 4n - 1, & \dots\} \end{array}$$

C) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{3, & 7, & 11, & 15, & \dots, & 4n + 1, & \dots\} \end{array}$$

Answer: A

B) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{3, & 7, & 11, & 15, & \dots, & 3n - 2, & \dots\} \end{array}$$

D) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{3, & 7, & 11, & 15, & \dots, & 3n + 2, & \dots\} \end{array}$$

298) _____

299) $\{7, 12, 17, 22, \dots\}$

A) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{7, & 12, & 17, & 22, & \dots, & 4n - 1, & \dots\} \end{array}$$

C) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{7, & 12, & 17, & 22, & \dots, & 5n + 1, & \dots\} \end{array}$$

Answer: B

B) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{7, & 12, & 17, & 22, & \dots, & 5n + 2, & \dots\} \end{array}$$

D) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \{7, & 12, & 17, & 22, & \dots, & 4n + 2, & \dots\} \end{array}$$

299) _____

300) $\left\{\frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \dots\right\}$

A) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \left\{\frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \dots, \frac{1}{n-3}, \dots\right\} \end{array}$$

C) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \left\{\frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \dots, \frac{1}{n+3}, \dots\right\} \end{array}$$

Answer: C

B) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \left\{\frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \dots, \frac{1}{n}, \dots\right\} \end{array}$$

D) $\{1, 2, 3, 4, \dots, n, \dots\}$

$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \\ \left\{\frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \dots, \frac{1}{n+2}, \dots\right\} \end{array}$$

300) _____

$$301) \left\{ \frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \dots \right\}$$

$$A) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \dots, \frac{2n-1}{2n+1}, \dots \right\}$$

$$C) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \dots, \frac{n+1}{3n-1}, \dots \right\}$$

Answer: A

$$B) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \dots, \frac{2n+1}{2n-1}, \dots \right\}$$

$$D) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \dots, \frac{3n-1}{n+1}, \dots \right\}$$

301) _____

$$302) \{ 1, 8, 27, 64, \dots \}$$

$$A) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 1, 8, 27, 64, \dots, 2n^3, \dots \}$$

$$C) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 1, 8, 27, 64, \dots, n^2, \dots \}$$

Answer: D

$$B) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 1, 8, 27, 64, \dots, n^4, \dots \}$$

$$D) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 1, 8, 27, 64, \dots, n^3, \dots \}$$

302) _____

$$303) \{ 5, 25, 125, 625, \dots \}$$

$$A) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 5, 25, 125, 625, \dots, 5^n, \dots \}$$

$$C) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 5, 25, 125, 625, \dots, n^5, \dots \}$$

Answer: A

$$B) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 5, 25, 125, 625, \dots, 5^{2n}, \dots \}$$

$$D) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\{ 5, 25, 125, 625, \dots, 5n, \dots \}$$

303) _____

$$304) \left\{ \frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots \right\}$$

$$A) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots, \frac{1}{2(3^n)}, \dots \right\}$$

$$C) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots, \frac{1}{2(3^{n-1})}, \dots \right\}$$

Answer: C

$$B) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots, \frac{1}{3(2^n)}, \dots \right\}$$

$$D) \{ 1, 2, 3, 4, \dots, n, \dots \}$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$\left\{ \frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots, \frac{1}{3(2^{n-1})}, \dots \right\}$$

304) _____

A one-to-one correspondence between the set of counting numbers and the given set has been established. Find an expression for the n th term of the given set that corresponds to the counting number n .

305)

{1, 3, 5, 7, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) $2n - 1$

B) $2n + 1$

C) $2n$

D) 2^n

Answer: A

305) _____

306)

{100, 200, 300, 400, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) n^{100}

B) $-100n$

C) $100n$

D) 100^n

Answer: C

306) _____

307)

{-1000, -2000, -3000, -4000, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) 1000^n

B) n^{1000}

C) $-1000n$

D) $1000n$

Answer: C

307) _____

308)

{3, 9, 27, 81, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) n^3

B) 3^n

C) $3 + n$

D) n^2

Answer: B

308) _____

309)

{200, 400, 600, 800, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) $-200n$

B) $n - 200$

C) $n + 200$

D) $200n$

Answer: D

309) _____

310)

{-11, -22, -33, -44, ..., □ ...}

↕ ↕ ↕ ↕ ↕ ↕

{1, 2, 3, 4, ..., n , ...}

A) $-11n$

B) $n + 11$

C) $11n$

D) $n - 11$

Answer: A

310) _____

311)

{5, 12, 19, 26, ..., □ ...}

$$\begin{array}{cccccc} \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow \\ \{1, & 2, & 3, & 4, & \dots, & n, & \dots\} \end{array}$$

A) $-7n - 2$

B) $7n + 2$

C) $7n - 2$

D) $-7n + 2$

Answer: C

311) _____

312)

{-3, -8, -13, -18, ..., □ ...}

$$\begin{array}{cccccc} \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow \\ \{1, & 2, & 3, & 4, & \dots, & n, & \dots\} \end{array}$$

A) $5n + 2$

B) $-5n + 2$

C) $-5n - 2$

D) $5n - 2$

Answer: B

312) _____

313)

{7, 49, 343, 2401, ..., □ ...}

$$\begin{array}{cccccc} \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow \\ \{1, & 2, & 3, & 4, & \dots, & n, & \dots\} \end{array}$$

A) n^2

B) 7^n

C) $7 + n$

D) n^7

Answer: B

313) _____

314)

{2, 5, 8, 11, ..., □ ...}

$$\begin{array}{cccccc} \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow \\ \{1, & 2, & 3, & 4, & \dots, & n, & \dots\} \end{array}$$

A) $3n$

B) $3n - 2$

C) $3n + 1$

D) $3n - 1$

Answer: D

314) _____

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.

315) {5, 6, 7, 8, ...}

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

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 4, & 5, & 6, & 7, & \dots, & n + 3, & \dots \} \end{array}$$

C) { 5, 6, 7, 8, ..., $n + 5$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 4, & 5, & 6, & 7, & \dots, & n + 3, & \dots \} \end{array}$$

Answer: B

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

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 6, & 7, & 8, & 9, & \dots, & n + 5, & \dots \} \end{array}$$

D) { 5, 6, 7, 8, ..., $n + 4$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 6, & 7, & 8, & 9, & \dots, & n + 6, & \dots \} \end{array}$$

315) _____

316) {3, 5, 7, 9, ...}

A) { 3, 5, 7, 9, ..., $2n + 5$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 5, & 7, & 9, & 11, & \dots, & 2n + 3, & \dots \} \end{array}$$

C) { 3, 5, 7, 9, ..., $2n + 1$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 4, & 6, & 8, & 10, & \dots, & 2n + 3, & \dots \} \end{array}$$

Answer: D

B) { 3, 5, 7, 9, ..., $2n + 2$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 5, & 7, & 9, & 11, & \dots, & 2n + 4, & \dots \} \end{array}$$

D) { 3, 5, 7, 9, ..., $2n + 1$, ...}

$$\begin{array}{cccccc} \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow \\ \{ & 5, & 7, & 9, & 11, & \dots, & 2n + 3, & \dots \} \end{array}$$

316) _____

317) $\{1, 8, 15, 22, \dots\}$

$$\begin{array}{l} \text{A) } \{ 1, \quad 8, \quad 15, \quad 22, \quad \dots, \quad 7n - 8, \quad \dots \} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \{ 8, \quad 15, \quad 22, \quad 29, \quad \dots, \quad 7n - 1, \quad \dots \} \\ \text{C) } \{ 1, \quad 8, \quad 15, \quad 22, \quad \dots, \quad 7n - 6, \quad \dots \} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \{ 8, \quad 15, \quad 22, \quad 29, \quad \dots, \quad 7n + 1, \quad \dots \} \end{array}$$

Answer: C

$$\begin{array}{l} \text{B) } \{ 1, \quad 8, \quad 15, \quad 22, \quad \dots, \quad 7n - 6, \quad \dots \} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \{ 8, \quad 15, \quad 22, \quad 29, \quad \dots, \quad 7n + 0, \quad \dots \} \\ \text{D) } \{ 1, \quad 8, \quad 15, \quad 22, \quad \dots, \quad 7n + 6, \quad \dots \} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \{ 8, \quad 15, \quad 22, \quad 29, \quad \dots, \quad 7n + 1, \quad \dots \} \end{array}$$

317) _____

318) $\left\{ \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \dots \right\}$

$$\begin{array}{l} \text{A) } \left\{ \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \dots, \frac{n+3}{9}, \dots \right\} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \left\{ \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}, \dots, \frac{n+4}{9}, \dots \right\} \\ \text{C) } \left\{ \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \dots, \frac{n+4}{9}, \dots \right\} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \left\{ \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}, \dots, \frac{n+5}{9}, \dots \right\} \end{array}$$

Answer: A

$$\begin{array}{l} \text{B) } \left\{ \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \dots, \frac{n}{9}, \dots \right\} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \left\{ \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}, \dots, \frac{n+1}{9}, \dots \right\} \\ \text{D) } \left\{ \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \dots, \frac{n-4}{9}, \dots \right\} \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \quad \downarrow \\ \quad \left\{ \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}, \dots, \frac{n-5}{9}, \dots \right\} \end{array}$$

318) _____