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

1) State whether the collection is well-defined or not well-defined.
$\{5, \ldots\}$
  A) Well-defined   B) Not well-defined
Answer: B

2) Let $A = \{6, 7, 8, 9, 10\}$.
State whether the following statement true or false $8 \notin A$
  A) True   B) False
Answer: B

3) Write the set using roster notation:
The set of even natural numbers less than 10.
  A) $\{x \mid x \in N \text{ and } x < 10\}$ B) $\{x \mid x \in E \text{ and } x < 10\}$
  C) $\{2, 4, 6, 8, 10\}$ D) $\{2, 4, 6, 8\}$
Answer: D

4) Write the set using roster notation:
$\{x \mid x \in N \text{ and } x > 24\}$
  A) $\{25, 26, 27, 28, \ldots\}$ B) $\{x \mid x \text{ is a natural number less than } 24\}$
  C) $\{x \mid x \text{ is a natural number greater than } 24\}$ D) $\{24, 25, 26, 27, \ldots\}$
Answer: A

5) Write the set using the descriptive method:
$\{9, 18, 27, 36, 45\}$
  A) $\{x \mid x \text{ is a natural number between 9 and 45}\}$
  B) The set natural numbers between 9 and 45.
  C) $\{x \mid x \text{ is a multiple of 9 less than 46}\}$
  D) The set of the first five positive multiples of 9.
Answer: D

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

6) Write the set using the descriptive method:
$\{25, 26, 27, \ldots, 45\}$
Answer: The set of natural numbers from 25 to 45, inclusive.

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

7) Write the set using set-builder notation:
The set of natural numbers greater than 11.
  A) $\{12, 13, 14, 15, \ldots\}$ B) $\{x \mid x \in N \text{ and } x > 11\}$
  C) $\{11, 12, 13, 14, \ldots\}$ D) $\{x \mid x > 11\}$
Answer: B

1

8) Write the set using set-builder notation:

{1, 3, 5, ..., 27}

   A) $\{x \mid x \in N$ and $x < 28\}$

   B) $\{x \mid x \in O$ and $x < 27\}$

   C) $\{x \mid x$ is an odd natural number less than 27$\}$

   D) $\{x \mid x$ is an odd natural number less than 28$\}$

Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
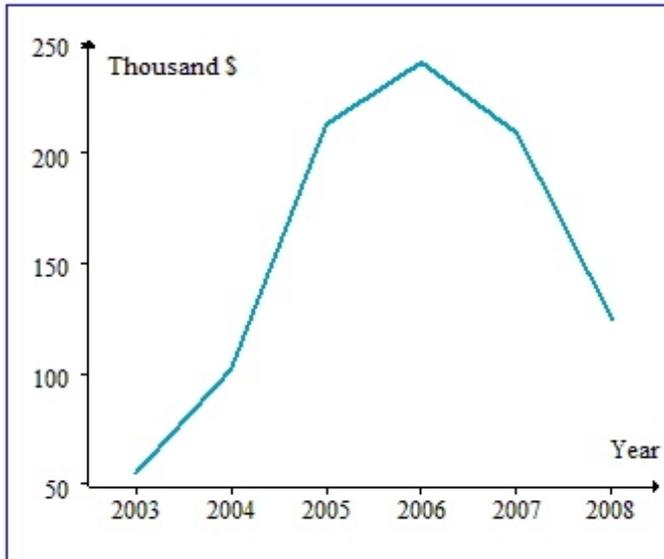
9) List the elements in the set: {7, 10, 13, ..., 31}.

Answer: {7, 10, 13, 16, 19, 22, 25, 28, 31}

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

10) The graph below displays the median housing prices for all houses sold in Anywhere, US between 2(2008.

Median Home Prices in Anywhere

List the set of years in which the median price was above $150,000.

   A) (2005, 2006, 2007, 2008}   B) (2003, 2004}

   C) (2005, 2006, 2007}   D) (2003, 2004, 2008}

Answer: C

11) Which statement is true?

   A) $\{9, 3, 0\} \neq \{3, 0, 9\}$ B) $n(\emptyset) = 0$

   C) $\emptyset = \{\emptyset\}$ D) All equivalent sets are equal.

Answer: B

12) State whether the following set is empty.

$\{x|x$ is a natural number divisible by $7\}$

A) Yes   B) No

Answer: B

13) Find the cardinal number for the set.

$A = \{3, 6, 9, \ldots, 33\}$

A) The set is infinite.   B) $n(A) = 33$

C) $n(A) = 11$ D) $n(A) = 4$

Answer: C

14) Find the cardinal number for the set.

$B = \{\text{eight}\}$

A) $n(B) = 8$ B) $n(B) = 5$ C) $n(B) = 0$ D) $n(B) = 1$

Answer: D

15) Which set is finite?

A) $\{x \mid x \in N$ and x is odd$\}$ B) $\{2, 4, 6, 8, 10, 12, \ldots\}$

C) $\{x \mid x \in N$ and $x > 100\}$ D) $\{x \mid x \in N$ and $x < 100\}$

Answer: D

16) Which set is infinite?

A) $\{x \mid x$ is an improper fraction$\}$ B) $\{x \mid x \in N$ and $x < 20\}$

C) $\emptyset$ D) $\{3, 5, 7, \ldots, 99\}$

Answer: A

17) Classify each pair of sets as equal, equivalent, or neither.

$\{a, b, c, d, e\}$ and $\{5, 4, 3, 2, 1\}$

A) equivalent   B) neither   C) equal and equivalent

Answer: A

18) Classify each pair of sets as equal, equivalent, or neither.

$\{1, 3, 5\}$ and $\{2, 4, 6, 8\}$

A) neither   B) equivalent   C) equal and equivalent

Answer: A

19) Classify each pair of sets as equal, equivalent, or neither.

$\{1, 2, 3, \ldots, 10\}$ and $\{10, 9, 8, \ldots, 1\}$

A) equal and equivalent   B) neither   C) equivalent

Answer: A

20) Show that the pair of sets is equivalent by using a one-to-one correspondence.

{x | x is an odd natural number between 8 and 20} and
{x | x is an even natural number between 13 and 25}

A)   {9,   10,   11,   12,   13,   14,   15,   16,   17,   18,   19}
     ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕
     {14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24}

B)   {9,   11,   13,   15,   17,   19}
     ↕   ↕   ↕   ↕   ↕   ↕
     {14, 16, 18, 20, 22, 24}

C)   {8,   9,   10,   11,   12,   13,   14,   15,   16,   17,   18,   19,   20}
     ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕   ↕
     {13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25}

D)   {8,   10,   12,   14,   16,   18,   20}
     ↕   ↕   ↕   ↕   ↕   ↕   ↕
     {13, 15, 17, 19, 20, 22, 23}

Answer: B

21) Let $U = \{8, 16, 24, 32, 40, 48, 56, 64\}$ and $A = \{24, 32, 40, 56\}$. A'

A) $A' = \{8, 16, 64\}$ B) $A' = \emptyset$

C) $A' = \{8, 16, 48, 64\}$ D) $A' = \{0\}$

Answer: C

22) Use the Venn diagram and find B'.

A) $B' = \{p, q, r, s, t\}$ B) $B' = \{p, q, r, s, t, w, x\}$

C) $B' = \{p, q, r, w, x\}$ D) $B' = \{p, q, r\}$

Answer: C

23) Let U = {5, 10, 15, 20, 25, 30, 35, 40}
    A = {5, 10, 15, 20}
    B = {25, 30, 35, 40}
    C = {10, 20, 30, 40}.
  Find C'.
  A) C' = {5, 15, 25, 35}
  B) C' = {5, 10, 15, 20, 25, 30, 35, 40}
  C) C' = {10, 20, 30, 40}
  D) C' = Ø
  Answer: A

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

24) Find all subsets of the set. {2, 4, 9}.

  Answer: Ø; {2}; {4}; {9}; {2, 4}; {2, 9}; {4, 9}; {2, 4, 9}

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

25) Find all proper subsets of the set. {c, f, x}
  A) Ø; {c}; {f}; {x}; {c, f}; {c, x}; {f, x}
  B) Ø; {c, f}; {c, x}; {f, x}; {c, f, x}
  C) Ø; {c, f}; {c, x}; {f, x}
  D) Ø; {c}; {f}; {x}; {c, f}; {c, x}; {f, x}; {c, f, x}
  Answer: A

26) True or False? {4} ⊆ {2, 4, 6, 8, 10}
  A) False
  B) True
  Answer: B

27) True or False? {4} ∈ {2, 4, 6, 8, 10, . . . }
  A) False
  B) True
  Answer: A

28) Which statement is false?
  A) Ø ⊆ {a, b, c}   B) Ø ⊂ {a, b, c}   C) a ∈ {a, b, c}   D) Ø ∈ {a, b, c}
  Answer: D

29) Find the number of subsets the set has. {1, 2, 3, 4, 5}
  A) 16   B) 31   C) 5   D) 32
  Answer: D

30) Find the number of proper subsets the set has. {m, n, p}
  A) 8   B) 3   C) 7   D) 6
  Answer: C

31) Since the student union is being remodeled, there is a limited choice of foods and drinks a student can buy for a snack between classes. Students can choose none, some, or all of these items: diet soft drink, cheeseburger, fries. How many different selections can be made?

    A) 9   B) 3   C) 7   D) 8

Answer: D

32) Use the Venn diagram and find $A \cap B$.
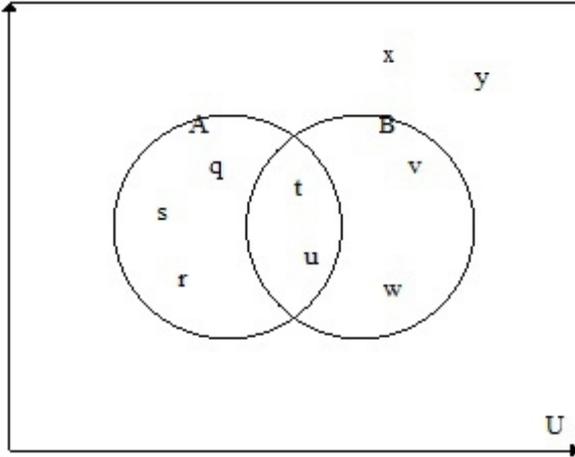
    A) $A \cap B = \{q, r, s, v, w\}$ B) $A \cap B = \{q, r, s, v, w, x, y\}$
    C) $A \cap B = \{q, r, s, t, u, v, w\}$ D) $A \cap B = \{t, u\}$

Answer: D

33) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
      $A = \{5, 10, 15, 20\}$
      $V = \{25, 30, 35, 40\}$
      $C = \{10, 20, 30, 40\}$.
  Find $A \cup C$.

    A) $A \cup C = \{5, 10, 15, 20, 30, 40\}$ B) $A \cup C = \emptyset$
    C) $A \cup C = \{10, 20\}$ D) $A \cup C = \{5, 15, 30, 40\}$

Answer: A

34) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
      $A = \{5, 10, 15, 20\}$
      $B = \{25, 30, 35, 40\}$
      $C = \{10, 20, 30, 40\}$.
  Find $A \cap B$.

    A) $A \cap B = \{10, 15\}$ B) $A \cap B = \{5, 10, 35, 40\}$
    C) $A \cap B = \{5, 10, 15, 20, 25, 30, 35, 40\}$ D) $A \cap B = \emptyset$

Answer: D

6

35) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
   $A = \{5, 10, 15, 20\}$
   $B = \{25, 30, 35, 40\}$
   $C = \{10, 20, 30, 40\}$.
   Find $A' \cap (B' \cup C')$.
   A) $A' \cap (B' \cup C') = 5, 10, 15, 20, 25, 30, 35, 40\}$
   B) $A' \cap (B' \cup C') = \emptyset$
   C) $A' \cap (B' \cup C') = \{10, 20, 25, 30, 35, 40\}$
   D) $A' \cap (B' \cup C') = \{25, 35\}$

   Answer: D

36) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
   $A = \{5, 10, 15, 20\}$
   $B = \{25, 30, 35, 40\}$
   $C = \{10, 20, 30, 40\}$.
   Find $B \cap C'$.
   A) $B \cap C' = \{5, 15\}$ B) $B \cap C' = \{30, 40\}$
   C) $B \cap C' = \emptyset$ D) $B \cap C' = \{25, 35\}$

   Answer: D

37) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
   $A = \{5, 10, 15, 20\}$
   $B = \{25, 30, 35, 40\}$
   $C = \{10, 20, 30, 40\}$.
   Find $A \cap C$.
   A) $A \cap C = \{5, 15, 30, 40\}$ B) $A \cap C = \emptyset$
   C) $A \cap C = \{10, 20\}$ D) $A \cap C = \{5, 10, 15, 20, 30, 40\}$

   Answer: C

38) Let $U = \{5, 10, 15, 20, 25, 30, 35, 40\}$
   $A = \{5, 10, 15, 20\}$
   $B = \{25, 30, 35, 40\}$
   $C = \{10, 20, 30, 40\}$.
   Find $A' \cup C'$
   A) $A' \cup C' = \emptyset$ B) $A' \cup C' = \{25, 35\}$
   C) $A' \cup C' = \{5, 10, 15, 20, 25, 30, 35, 40\}$ D) $A' \cup C' = \{5, 15, 25, 30, 35, 40\}$

   Answer: D

39) Let $U = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$
   $X = \{4, 6, 8, 10, 12, 14\}$
   $Y = \{4, 5, 6, 7, 8, 9\}$
   $Z = \{5, 7, 8, 9, 12, 13, 14\}$.
   Find $(X \cap Y) \cap Z$.
   A) $(X \cap Y) \cap Z = \{8\}$
   B) $(X \cap Y) \cap Z = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$
   C) $(X \cap Y) \cap Z = \{4, 5, 6, 7, 8, 9, 10, 12, 13, 14\}$
   D) $(X \cap Y) \cap Z = \varnothing$

   Answer: A

40) Let $U = \{1, 2, 3, \ldots\}$
   $A = \{4, 8, 12, 16, \ldots\}$
   $B = \{12, 24, 36, 48, \ldots\}$.
   Find $A \cup B$.
   A) $A \cup B = A$ B) $A \cup B = U$ C) $A \cup B = \varnothing$ D) $A \cup B = B$

   Answer: A

41) Let $U = \{n, p, q, r, s, t, u, v\}$
   $A = \{n, p, q, r\}$
   $B = \{n, q, s, u\}$.
   Find $B - A$.
   A) $B - A = \{s, u\}$ B) $B - A = \varnothing$
   C) $B - A = \{n, p, q, r, s, u\}$ D) $B - A = \{s, t, u, v\}$

   Answer: A

8

42) Draw a Venn diagram and shade the sections representing $A \cup B'$.

A)
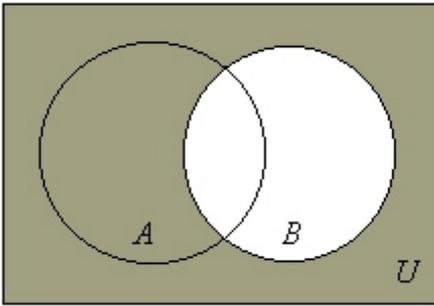
B)
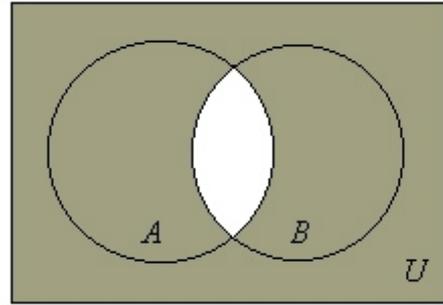
C)
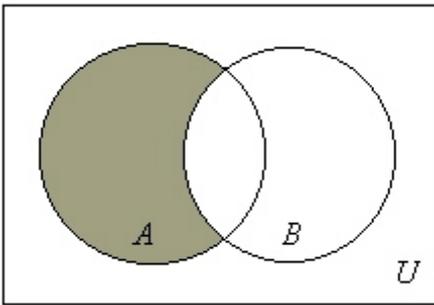
D)
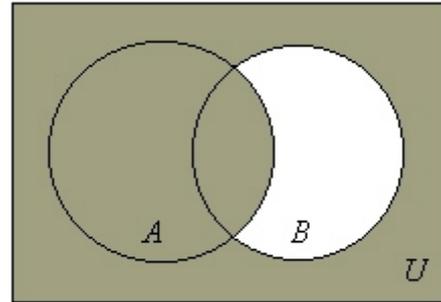
Answer: D

43) Draw a Venn diagram and shade the sections representing $(A \cup B)'$.

A)
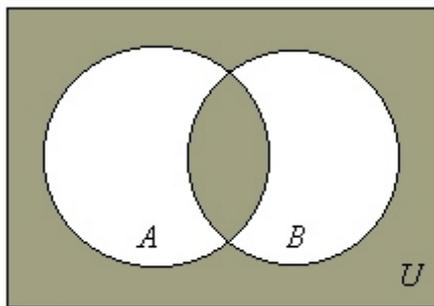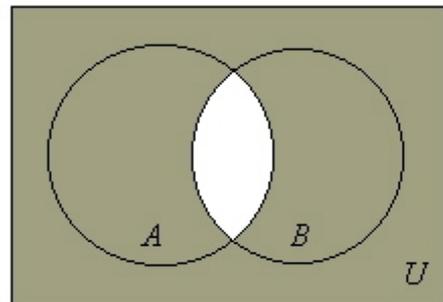

B)
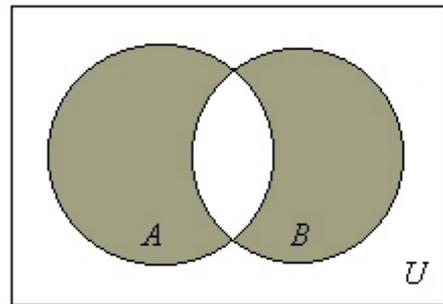
C)
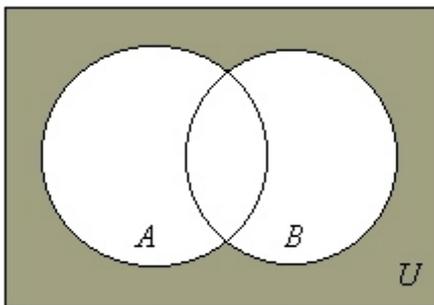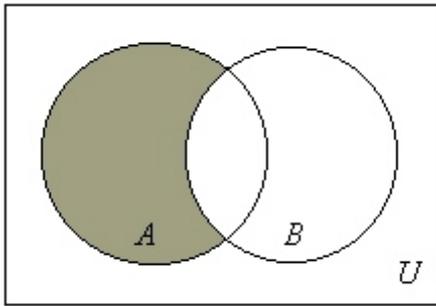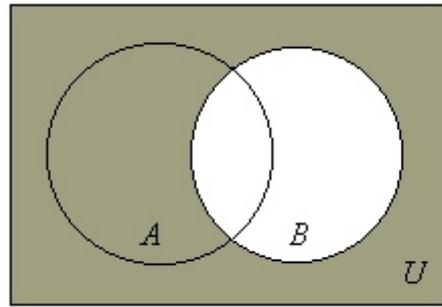

D)

Answer: C

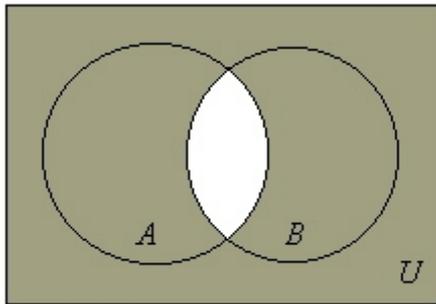44) Draw a Venn diagram and shade the sections representing $A \cap B'$.

A)
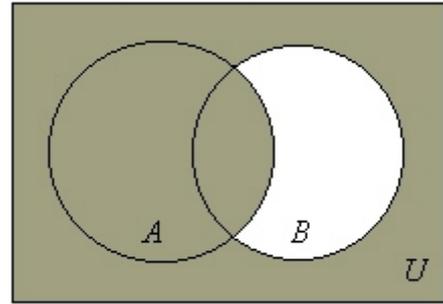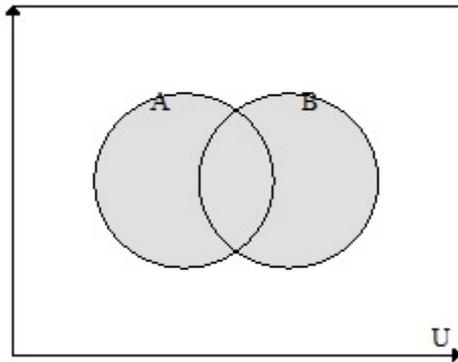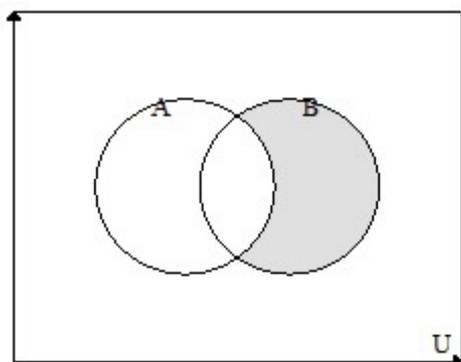

B)

C)

D)

Answer: A

45) A = {people who drive a compact car} and B = {people who drive a diesel vehicle}. Draw a Venn diagram of $A \cap B$ and write a sentence describing what the set represents.
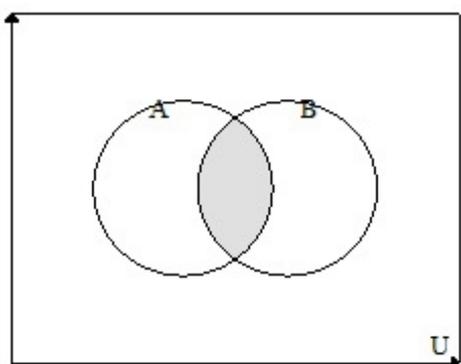
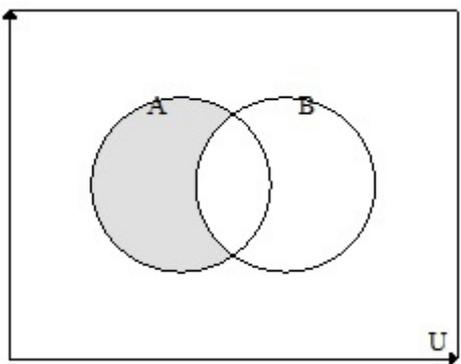A) People who drive a compact car or a diesel vehicle

B) People who drive a diesel vehicle, but not a compact car.
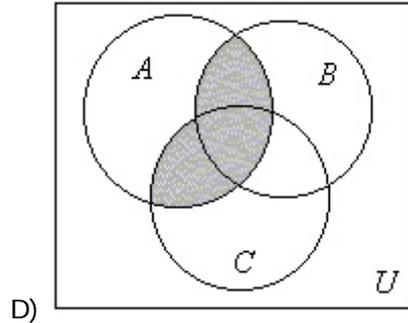

C) People who drive a diesel compact car.

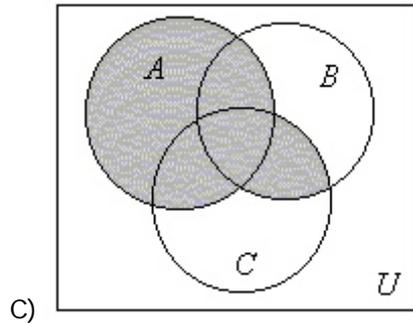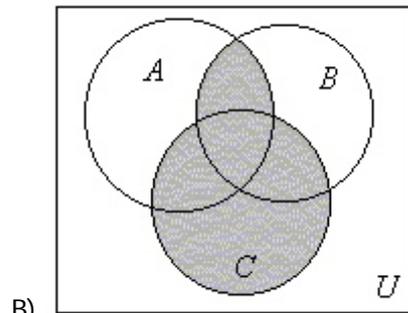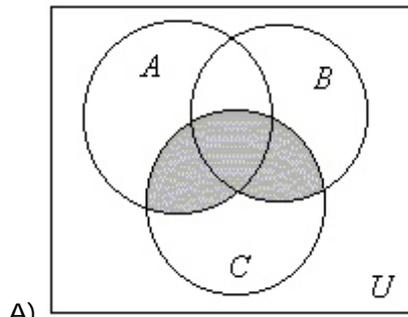D) People who drive a compact car,but not a diesel vehicle.

Answer: C

46) Draw a Venn diagram and shade the sections representing
A ∩ (B ∪ C)

A)

B)

C)

D)

Answer: D

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

47) Draw a Venn diagram and shade the sections representing $A \cap (B \cap C)'$

Answer:
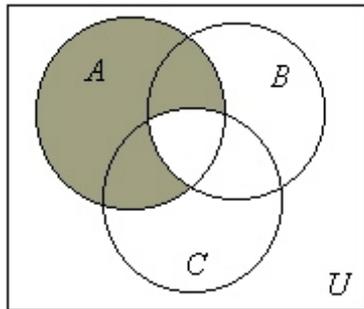
48) Draw a Venn diagram and shade the sections representing $(B \cup A) \cup A'$.

A)
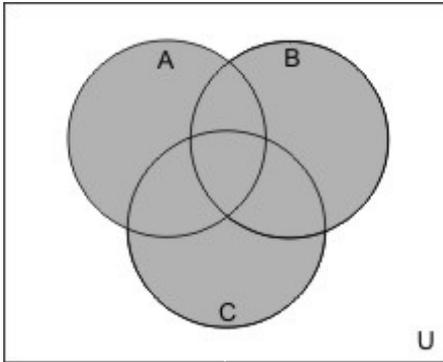
B)
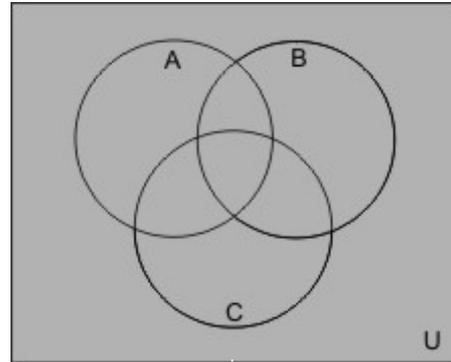
C)
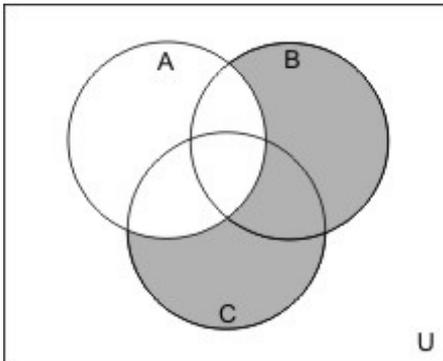
D)
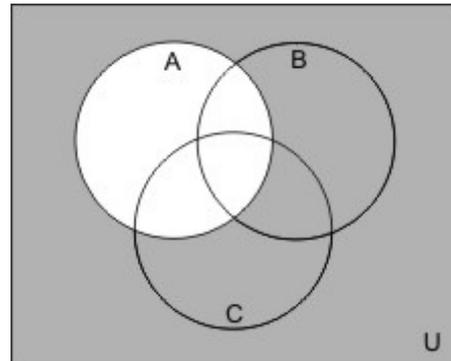
Answer: B

49) $X = \{$students running cross country$\}$, $Y = \{$students swimming$\}$, and $Z = \{$students running track$\}$.
Draw a Venn diagram of $Z - (X \cup Y)$, and write a sentence describing what the set represents.

A) Students running track but not running cross country or swimming.
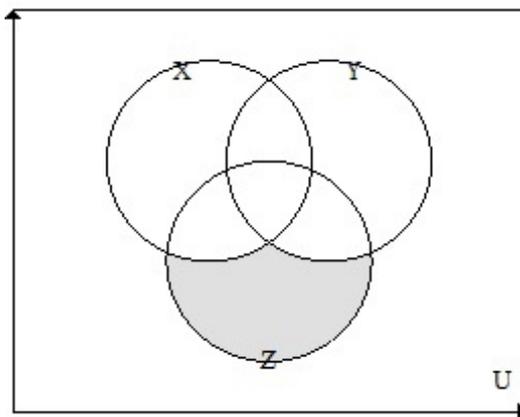
B) Students not running cross country and not swimming.
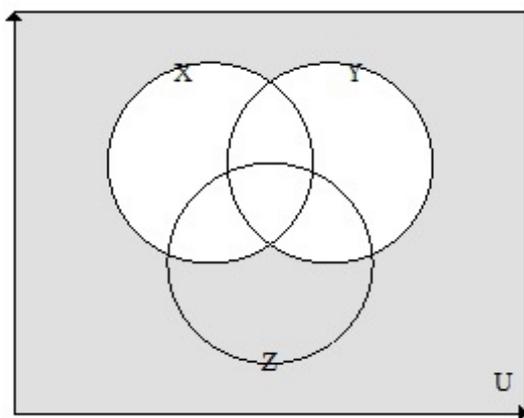
C) Students running track but not playing all three sports.
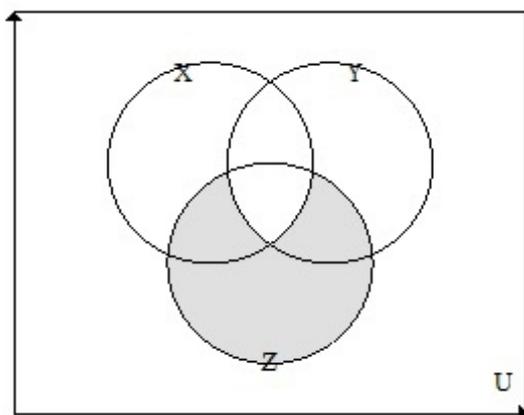
D) Students running cross country, swimming and running track, or running track only.
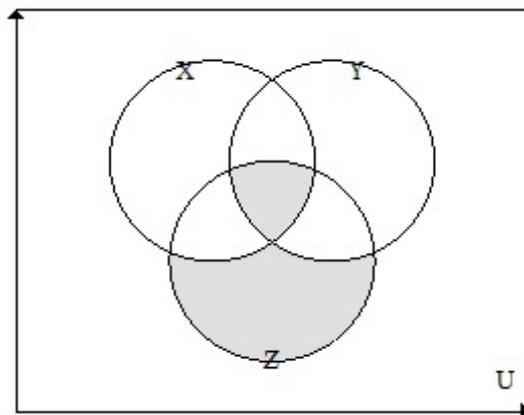
Answer: A

50) The table shows the students from Genius High School with the four highest GPAs from 2005 to 2007. Write the region(s) of the Venn diagram that would include Harry. (Note set X represents 2005 top-ranked students, set Y represents 2006 top-ranked students, and set Z represents 2007 top-ranked students.)

Year	2005	2006	2007
Students	Laura	Carols	Laura
	Kellyn	Stefan	Sasha
	Henry	Harry	Henry
	Harry	Georg	Harry
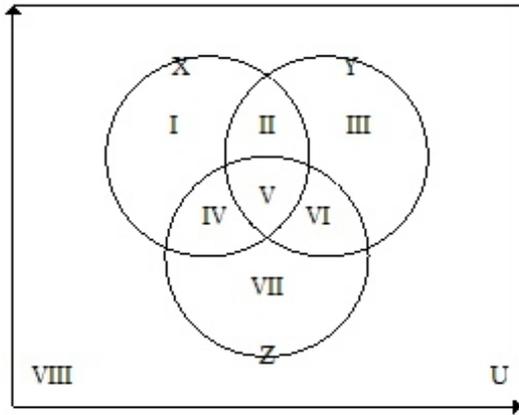
A) Region II   B) Region VI   C) Region IV   D) Region V

Answer: D

51) Determine whether the two sets are equal.
$(D \cup E)'$ and $D' \cup E'$
    A) not equal   B) equal

Answer: A

52) If $U = \{$Bob, Ann, Mae, Eve, Dan, Kim, Tal, Vic$\}$, $A = \{$Ann, Eve, Dan, Kim$\}$, and
$B = \{$Bob, Ann, Mae, Eve$\}$ find $(A \cup B)'$ and $A' \cap B'$.
    A) Both are $\{$Ann, Eve$\}$
    B) Both are $\varnothing$
    C) Both are $\{$Tal, Vic$\}$
    D) Both are $\{$Bob, Ann, Mae, Eve, Dan, Kim$\}$

Answer: C

53) If U = {Bob, Ann, Mae, Eve, Dan, Pat, Tal, Liz}, A = {Ann, Eve, Dan, Pat}, and
B = {Bob, Ann, Mae, Eve} find $(A \cap B)'$ and $A' \cup B'$.

A) Both are {Bob, Mae, Eve, Dan, Pat}
B) Both are $\emptyset$
C) Both are {Ann, Eve}
D) Both are {Tal, Liz}

Answer: A

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

54) Determine whether the two sets are equal.
$(A \cup B') \cap C$ and $(A \cap C) \cup (B' \cap C)$

Answer: equal

55) Determine whether the two sets are equal.
$A \cup (B \cap C)'$ and $A \cap (B' \cup C')$

Answer: not equal

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

56) Use the Venn diagram and find $n(A \cup B)$.
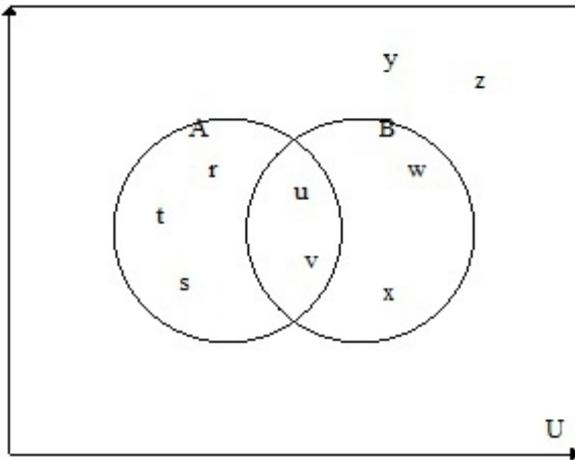
A) $n(A \cup B) = 2$
B) $n(A \cup B) = 9$
C) $n(A \cup B) = 7$
D) $n(A \cup B) = 5$

Answer: C

57) Let U = {$x \mid x$ is a natural number < 15}
A = {$x \mid x$ is an odd natural number}
B = {$x \mid x$ is a prime number}.
Find $n(A \cup B)$. Note: prime numbers are 2, 3, 5, 7 ,11, 13, 17, 19.

A) $n(A \cup B) = 12$
B) $n(A \cup B) = 7$
C) $n(A \cup B) = 8$
D) $n(A \cup B) = 2$

Answer: C

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58) In a survey of 18 college students, it was found that 11 were taking an English class, 6 were taking a math class, and 4 were taking both English and math. How many students were taking a math class only?

    A) 11   B) 2   C) 7   D) 5

Answer: B

59) In a survey of 29 instructors, it was found that 22 liked whiteboards, 11 liked blackboards, and 7 liked both. How many instructors did not like whiteboards?

    A) 14   B) 7   C) 3   D) 4

Answer: B

60) In a group of 53 children, 22 had a dog, 18 had a cat, and 6 had both a dog and a cat. How many children had neither a dog nor a cat as a pet?

    A) 31   B) 37   C) 12   D) 19

Answer: D

61) One weekend, there were 98 pizzas ordered for the sophomore dorm. That weekend 19 customers ordered their pizza with just pepperoni, 16 customers ordered their pizza with just sausage, 20 ordered theirs with just onions, 15 ordered theirs with pepperoni and sausage, 9 ordered theirs with sausage and onions, 17 ordered theirs with pepperoni and onions, and 2 ordered theirs with all three items. How many customers ordered their pizza with pepperoni or sausage (or both)?

    A) 72   B) 35   C) 50   D) 13

Answer: A

62) One weekend, there were 61 pizzas ordered for the sophomore dorm. That weekend 12 customers ordered their pizza with just pepperoni, 18 customers ordered their pizza with just sausage, 13 ordered theirs with just onions, 6 ordered theirs with pepperoni and sausage, 5 ordered theirs with sausage and onions, 4 ordered theirs with pepperoni and onions, and 2 ordered theirs with all three items. The remaining pizzas were cheese pizzas with no toppings. How many customers ordered at most two toppings on their pizza?

    A) 58   B) 15   C) 16   D) 59

Answer: D

63) Upon examining the contents of 38 backpacks, it was found that 23 contained a black pen, 27 contained a blue pen, and 21 contained a pencil, 15 contained both a black pen and a blue pen, 12 contained both a black pen and a pencil, 18 contained both a blue pen and a pencil, and 10 contained all three items. How many backpacks contained none of the three writing instruments?

    A) 2   B) 15   C) 11   D) 3

Answer: A

64) Upon examining the contents of 38 backpacks, it was found that 23 contained a black pen, 27 contained a blue pen, and 21 contained a pencil, 15 contained both a black pen and a blue pen, 12 contained both a black pen and a pencil, 18 contained both a blue pen and a pencil, and 10 contained all three items. How many backpacks contained exactly one of the three writing instruments?

   A) 3   B) 11   C) 2   D) 15

Answer: B

65) Upon examining the contents of 38 backpacks, it was found that 23 contained a black pen, 27 contained a blue pen, and 21 contained a pencil, 15 contained both a black pen and a blue pen, 12 contained both a black pen and a pencil, 18 contained both a blue pen and a pencil, and 10 contained all three items. How many backpacks contained exactly two of the three writing instruments?

   A) 11   B) 2   C) 15   D) 3

Answer: C

66) Which set is finite?

A) $\{2, 4, 6, 8, 10, 12, \ldots\}$ B) $\{x \mid x \in N \text{ and } x < 100\}$

C) $\{x \mid x \in N \text{ and } x \text{ is odd}\}$ D) $\{x \mid x \in N \text{ and } x > 100\}$

Answer: B

67) Which set is infinite?

A) $\varnothing$ B) $\{x \mid x \text{ is an improper fraction}\}$

C) $\{3, 5, 7, \ldots, 99\}$ D) $\{x \mid x \in N \text{ and } x < 20\}$

Answer: B

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

68) Show that the set is an infinite set. $\{6, 12, 18, 24, 30, \ldots\}$

Answer:

$$\{6, \quad 12, \quad 18, \quad 24, \quad 30, \quad \ldots, \quad 6n, \quad \ldots\}$$
$$\updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \qquad \updownarrow$$
$$\{12, \quad 24, \quad 36, \quad 48, \quad 60, \quad \ldots, \quad 12n, \quad \ldots\}$$

69) Show that the set is an infinite set. $\{0, 4, 8, 12, 16, \ldots\}$

Answer:

$$\{0, \quad 4, \quad 8, \quad 12, \quad 16, \quad \ldots, \quad 4n - 4, \quad \ldots\}$$
$$\updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \qquad \updownarrow$$
$$\{4, \quad 12, \quad 20, \quad 28, \quad 36, \quad \ldots, \quad 8n - 4, \quad \ldots\}$$

70) Show that the set is an infinite set. $\left\{\dfrac{2}{1}, \dfrac{2}{2}, \dfrac{2}{3}, \dfrac{2}{4}, \dfrac{2}{5}, \ldots\right\}$

Answer:

$$\left\{\dfrac{2}{1}, \dfrac{2}{2}, \dfrac{2}{3}, \ldots, \dfrac{2}{n}, \ldots\right\}$$

$$\updownarrow \quad \updownarrow \quad \updownarrow \qquad \updownarrow$$

$$\left\{\dfrac{2}{2}, \dfrac{2}{3}, \dfrac{2}{4}, \ldots, \dfrac{2}{n+1}, \ldots\right\}$$

71) Show that the set is an infinite set. $\left\{\dfrac{1}{10}, \dfrac{1}{100}, \dfrac{1}{1{,}000}, \dfrac{1}{10{,}000}, \ldots\right\}$

Answer:

$$\left\{\dfrac{1}{10}, \dfrac{1}{100}, \ldots, \dfrac{1}{10^n}, \ldots\right\}$$

$$\updownarrow \qquad \updownarrow \qquad \updownarrow$$

$$\left\{\dfrac{1}{100}, \dfrac{1}{10{,}000}, \ldots, \dfrac{1}{10^{2n}}, \ldots\right\}$$

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

72) Find the general term of the set. $\{-10, -20, -30, -40, -50, \ldots\}$

   A) $-11n + 1$ B) $-9n - 1$ C) $-10n$ D) $n - 11$

Answer: C

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

73) Find the general term of the set. $\left\{\dfrac{1}{14}, \dfrac{1}{15}, \dfrac{1}{16}, \dfrac{1}{17}, \dfrac{1}{18}, \ldots\right\}$

Answer: $\dfrac{1}{n + 13}$

74) The general term of the set $\left\{\dfrac{1}{46}, \dfrac{2}{46}, \dfrac{3}{46}, \dfrac{4}{46}, \dfrac{5}{46}, \ldots\right\}$ is _____ .

Answer: $\dfrac{n}{46}$

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

75) Find the general term of the set. {9, 12, 15, 18, 21, . . .}

   A) $2n + 7$ B) $9n$ C) $4n + 5$ D) $3n + 6$

   Answer: D

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

76) Show that the set of positive rational numbers with denominators 3 or 5 is a countable set. (Rational numbers are fractions with integers in the numerator and denominator.)

   Answer: One possibility:

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \, ...$$
$$\updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow \quad \updownarrow$$
$$\frac{1}{3} \quad \frac{1}{5} \quad \frac{2}{3} \quad \frac{2}{5} \quad \frac{3}{3} \quad \frac{3}{5} \, ...$$

$$n \rightarrow \begin{cases} \dfrac{n+1}{6} & \text{if } n \text{ is odd} \\[3mm] \dfrac{n}{6} & \text{if } n \text{ is even} \end{cases}$$

77) Show that the given set is countable. {3, 6, 9, 12, 15, ...}

   Answer: The set is countable because it can be put into one-to-one correspondence with the set of natural numbers.

1	2	3	4	5,...,	n, ...
$\updownarrow$	$\updownarrow$	$\updownarrow$	$\updownarrow$	$\updownarrow$	$\updownarrow$
3	6	9	12	15	$3n$, ...