## Test Bank for Mathematics All Around 6th Edition by Pirnot IBSN 9780134800165

Full Download: http://downloadlink.org/product/test-bank-for-mathematics-all-around-6th-edition-by-pirnot-ibsn-9780134800165/ MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use s	et notation to list all the elemen	ts of the set.		
	1) The integers between 4 and $(4, 5, (7))$	8, not inclusive	$C$ $(A \in (7, 9))$	$\mathbf{D}$ (E ( $\mathbf{T}$ $\mathbf{Q}$ )
	A) {4, 5, 6, 7}	D) {3, 6, 7}	C) {4, 5, 6, 7, 8}	D) {5, 6, 7, 8}
	Answer: B			
	2) The integers from 3 to 7 incl	usive		
	A) {3, 4, 5, 6}	B) {4, 5, 6}	C) {3, 4, 5, 6, 7}	D) {4, 5, 6, 7}
	Answer: C			
	3) The whole numbers greater	than 3 and less than 7		
	A) {4, 5, 6}	B) {4, 5, 6, 7}	C) {3, 4, 5, 6}	D) {3, 4, 5, 6, 7}
	Answer: A			
	4) The letters needed to spell the	nese words:		
	tear, rate, rat, tea			
	A) $\{t,t,a,a,r,r,e\}$		B) $\{r, a, t\}$	
	C) {t,t,t,t,r,r,r,a,a,a,a,e,e,e}		D) $\{a,e,r,t\}$	
	Answer: D			
	5) {x : x is an integer between 1	4 and 17 inclusive}		
	A) {14, 15, 16, 17}		B) {15} or {16}	
	C) {13, 14, 15, 16, 17, 18}		D) {15, 16}	
	Answer: A			
	6) {x : x is an integer between 1	5 and 18 not inclusive}		
	A) {16} or {17}		B) {16, 17}	
	C) {14, 15, 16, 17, 18, 19}		D) {15, 16, 17, 18}	
	Answer: B			
	7) {x : x is an even natural num	ber less than 10}		
	A) {2, 4, 6, 8}		B) {1, 2, 3, 4, 5, 6, 7, 8, 9}	
	C) {0, 1, 2, 3, 4, 5, 6, 7, 8, 9	}	D) {0, 2, 4, 6, 8}	
	Answer: A			
	8) The natural numbers betwee	en –3 and 1, not inclusive		
	A) {0, 1}	B) {0}	C) {-2, -1, 0}	D) Ø
	Answer: D			
	9) The whole numbers betwee	n –3 and 0, not inclusive		
	A) {0}	B) {-2, -1}	C) Ø	D) {-3, -2, -1, 0}
	Answer: C			

# Use an alternative method to express the set.

10) {x: x has bike trails}

The table shows some of the facilities available at selected State Parks in New Jersey.

		hiking			bike	visitor	
	camping	trails	boating	swim	ming trails	center	
Allaire	yes	yes	no	yes	no	yes	
Parvin	yes	yes	yes	yes	no	yes	
Delaware and Raritan Canal	no	yes	yes	yes	yes	no	
Corson's Inlet	no	yes	yes	no	no	no	
Wharton Forest	yes	yes	yes	yes	no	yes	
A) {Allaire, Parvin, Corson'	s Inlet, W	harton	Forest}		B) (Delawa	are and I	Raritan Canal)
C) Ø					D) {Delawa	are and I	Raritan Canal}
Answer: D							
11) {t, a, b, l, e}							
A) $\{z : z \text{ is a letter in the wo}$	rd table}				B) {table}		
C) $\{z : z \text{ is a table}\}$					D) (z is a le	etter in ta	able)
Answer: A							
12) {d : d is a letter in the word ca	t and also	o in the	word in	ł			
A) (c, a, t, i, n)	B) { }				C) {c, a, t, i	, n}	D) {Ø}
Answer: B							
<ul> <li>A) {x : x is a multiple of 7 g</li> <li>B) {b : b is a multiple of 7 g</li> <li>C) {t : t is a multiple of 7 gr</li> <li>D) {w : w is a multiple of 7}</li> <li>Answer: C</li> </ul> Determine whether the set is well define	reater tha reater tha eater thar <b>ned or no</b>	n 21 ar n or ec n 20 and <b>t.</b>	nd less th jual to 21 d less tha	an 105  }  n 106	5}		
A) Not well defined Answer: B	as won at	vv1mbl	edon}		B) Well de	fined	
15) {x : x is a low-fat ice cream} A) Not well defined Answer: A					B) Well de	fined	
16) {x :x is a football team that has A) Not well defined Answer: B	s won the	Super	Bowl}		B) Well de	fined	
17) {x : x is horror books in the lib A) Not well defined Answer: A	rary}				B) Well de	fined	
18) {x : x is stock on the AmEx too A) Not well defined Answer: B	lay}				B) Well de	fined	

19) {x : x is an expensive boat ( A) Not well defined	on the Great Lakes}	B) Well defined	
Answer: A			
20) {x : x is a four-year college A) Not well defined Answer: B	in Georgia}	B) Well defined	
Replace the <i>#</i> with either <i>∈</i> or <i>∉</i> to e	press a true statement.		
21) 88 # {8, 16, 24, 32, }		-	
A) ∈		B) ∉	
Answer: A			
22) –4.5 # {n : n is a whole nun	ıber}		
A) ∉		B) ∈	
Answer: A			
23) Iowa # {r : r is a state in the A) ∈	United States}	B) ∉	
Answer: A			
24) Ohio # {California, Vermon A) ∉ Answer: A	nt, Colorado, New Jersey,	Washington, Kentucky} B) ∈	
Find n(A) for the set. 25) A = {0, 2, 4, 6, 8} A) n(A) = 5	B) $n(A) = 8$	C) $n(A) = 2$	D) $n(A) = 4$
Answer: A	_)()	-) - () -	_ ) - ()
	,		
26) $A = \{x : x \text{ is a month in the} A\} p(A) = 52$	year} B) $p(A) = 1$	() $p(A) = 12$	D) $p(A) = 24$
$\frac{1}{1} \prod_{i=0}^{n} \frac{1}{2}$	$D$ $\Pi(T) = 1$	$C/\Pi(II) = 12$	$D$ $\Pi(T) = 24$
Albwel. C			
27) A = {x : x is a second in a n	ninute}		
A) $n(A) = 60$	B) $n(A) = 12$	C) $n(A) = 120$	D) $n(A) = Infinite$
Answer: A			
28) A = $\{-9, -8, -7, \dots, 0\}$			
A) $n(A) = 10$	B) $n(A) = 9$	C) $n(A) = 4$	D) $n(A) = 1$
Answer: A			
29) A = {{a, b}, {c, d}, {e, b}}			
A) $n(A) = 5$	B) $n(A) = 2$	C) $n(A) = 3$	D) $n(A) = 6$
Answer: C			
30) $A = \{ \emptyset \ 0 \}$			
A) $n(A) = \emptyset$	B) $n(A) = 1$	C) $n(A) = 0$	D) $n(A) = 2$
Answer: D	· · · ·	, , , ,	· · · /

3	$B1) A = \{\{\emptyset\}, \{0\}, \{\emptyset, 0\}\}\$			
	A) $n(A) = 2$	B) $n(A) = 4$	C) $n(A) = 0$	D) $n(A) = 3$
	Answer: D			
3	32) A = {x : x is a vowel in the wor	d infinite}		
	A) $n(A) = 3$	B) $n(A) = 2$	C) $n(A) = 5$	D) $n(A) = 4$
	Answer: B			
Identify	y the set as finite or infinite.			
3	33) {4, 5, 6,, 16}			
	A) Finite		B) Infinite	
	Answer: A			
З	34) {1, 1/3, 1/9, 1/27,}			
	A) Infinite		B) Finite	
	Answer: A			
3	35) {x : x is a fraction between 5 ar	nd 6}		
	A) Infinite		B) Finite	
	Answer: A			
З	36) {2, 4, 6, 8,}			
	A) Infinite		B) Finite	
	Answer: A			
3	87) The set of even whole number	s less than 50		
	A) Infinite		B) Finite	
	Answer: B			
З	88) The set of even numbers great	er than 100		
	A) Finite		B) Infinite	
	Answer: B			
З	39) The set of multiples of 3 betwe	een 0 and 100		
	A) Infinite		B) Finite	
	Answer: B			
4	(0) The set of fractions that are les	s than 1 but greater than 0		
	A) Infinite		B) Finite	
	1110WC1. 11			
4	<ol> <li>The set of people watching fire A) Finite</li> </ol>	eworks at Miller Park on July	4, 2000 at 9:45 P.M. B) Infinite	
	Answer: A		·	
4	2) The set of stars in the Milkv W	ay Galaxy at 12:00 A.M. on Ia	anuary 1, 2000	
	A) Finite	J J J	B) Infinite	
	Answer: A			

Decide whether the sets are equal.	
43) {b: b is a positive integer} and {k : k is a counting number} A) Yes	B) No
Answer: A	
44) {y : y was an American President in the year 1573} and $\emptyset$ A) No	B) Yes
Answer: B	
45) {parsley, thyme, saffron, oregano} and {y : y is an herb} A) Yes	B) No
Answer: B	
46) {6, 12, 18, 24, 48} and {6, 12, 18, 24,, 48} A) No	B) Yes
Answer: A	
Decide whether the statement is true or false. 47) {12, 20, 32, 52} ⊆ {2, 4, 6, 8,, 98} A) False	B) True
Answer: B	2) 1100
48) {12, 84, 145, 264} ⊆ {12, 24, 36,, 1080} A) True	B) False
Answer: B	
49) {a : a is an odd integer} < {b : b is a positive integer} A) True	B) False
Answer: B	
50) ∅ ⊆ {4, 8, 12, 16, 20} A) False	B) True
Answer: B	
Decide whether the sets are equivalent	
51) {x : x is a multiple of 10 between 1 and 100, inclusive} and {9, A) Yes	, 18, 27,, 90} B) No
Answer: A	
52) {d: d is a month of the year} and {g : g is a state in the United A) Yes	States} B) No
Answer: B	
53) {64, 26, 87, 9, 68} and {z, m, c, u, y} A) Yes	B) No
Answer: A	
54) {Ø} and {x : x is a state in the U.S. with a minimum voting ag A) No	e of 64} B) Yes
Answer: A	

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

- 55) List all of the two element subsets of the set {a, b, c, d}. Answer: {a, b}, {a, c}, {a, d}, {b, c}, {b, d}, {c, d}
- 56) List all of the two element subsets of the set {a, b, c, d, e}. Answer: {a, b}, {a, c}, {a, d}, {a, e}, {b, c}, {b, d}, {b, e}, {c, d}, {c, e}, {d, e}
- 57) List all of the three element subsets of the set {a, b, c, d}. Answer: {a, b, c}, {a, b, d}, {a, c, d}, {b, c, d}
- 58) List all of the three element subsets of the set {a, b, c, d, e}. Answer: {a, b, c}, {a, b, d}, {a, b, e}, {a, c, d}, {a, c, e}, {a, d, e}, {b, c, d}, {b, c, e}, {b, d, e}, {c, d, e}

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

Use the following definitions to determine if the statement is true or false.				
$N = \{x : x \text{ is a natural number}\}$				
$\mathbf{R} = \{\mathbf{x} : \mathbf{x} \text{ is an integer}\}$				
$W = \{x : x \text{ is a whole number}\}$				
$\Omega = \{x : x \text{ is a rational number}\}$				
(x, x) is a subset of W. I. O. and R				
A) True	B) False			
Answer: A	,			
60) W is a subset of N, W, I, O, and R.				
A) True	B) False			
Answer: B				
61) I is a subset of Q.				
A) True	B) False			
Answer: A				
62) N is a subset of N.				
A) True	B) False			
Answer: A				
63) W is a proper subset of I, Q, and R.				
A) True	B) False			
Answer: A				
64) W is a proper subset of I, Q, N, and R.				
A) True	B) False			
Answer: B				
65) I is a proper subset of Q and R.				
A) True	B) False			
Answer: A				

	66) I is a proper subset of N, W, Q, A) True	and R.	B) False	
	Answer: B			
	67) Q is a proper subset of R. A) True		B) False	
	Answer: A			
	68) Q is a proper subset of N, I, and A) True	ł W.	B) False	
	Answer: B			
Find t	he number of subsets of the set. 69) {14, 15, 16}			
	A) 6	B) 7	C) 3	D) 8
	Answer: D			
	70) {0}			
	A) 2	B) 0	C) 1	D) 4
	Answer: A			
	71) {mom, dad, son, daughter} A) 16	B) 14	C) 8	D) 12
	Answer: A			
	72) {math, English, history, science, A) 24	, art} B) 32	C) 28	D) 16
	Answer: B			
	73) {x   x is a day of the week} A) 124	B) 128	C) 127	D) 256
	Answer: B			
	74) {x   x is an even number betwee A) 1024	en 17 and 37} B) 7	C) 36	D) 128
	Answer: A			-
	75) {1, 2, 3, , 8} A) 512	B) 256	C) 16	D) 252
	Answer: B			
Let U A B C	= {q, r, s, t, u, v, w, x, y, z} = {q, s, u, w, y} = {q, s, y, z} = {v, w, x, y, z}. List the elements in $76$ A $\circ$ B'	n the set.		
	A) {r, s, t, u, v, w, x, z} C) {q, s, t, u, v, w, x, y} Answer: B		B) {u, w} D) {t, v, x}	

77) (A ∪ B)' A) {t, v, x} Answer: D	B) {r, s, t, u, v, w, x, z}	C) {s, u, w}	D) {r, t, v, x}
78) (A ∩ B)' A) {s, u, w} C) {q, s, t, u, v, w, x, y} Answer: D		B) {t, v, x} D) {r, t, u, v, w, x, z}	
79) A' ∪ B A) {q, r, s, t, v, x, y, z} C) {r, s, t, u, v, w, x, z} Answer: A		B) {q, s, t, u, v, w, x, y} D) {s, u, w}	
80) A ∪ (B ∩ C) A) {q, r, w, y, z} Answer: D	B) {q, w, y}	C) {q, y, z}	D) {q, s, u, w, y, z}
81) A ∩ (B ∪ C) A) {q, s, w, y} Answer: A	B) {q, y, z}	C) {q, s, u, w, y, z}	D) {q, r, w, y, z}
82) C' ∪ A' A) {w, y} C) {q, r, s, t, u, v, x, z} Answer: C		B) {s, t} D) {q, s, u, v, w, x, y, z}	
83) C' ∩ A' A) {q, r, s, t, u, v, x, z} C) {q, s, u, v, w, x, y, z} Answer: D		B) {w, y} D) {r, t}	
84) C – A A) {q, s, u} Answer: C	B) {q, s, u, v, x, z}	C) {v, x, z}	D) {w, y}
85) A – C A) {q, s, u, v, x, z} Answer: C	B) {w, y}	C) {q, s, u}	D) {v, x, z}

Let U = {all soda pops}; A = {all diet soda pops}; B = {all cola soda pops}; C = {all soda pops in cans}; and D = {all caffeine-free soda pops}. Describe the given set in words. 86) A \circ B

$\mathbf{D}$ $\mathbf{A} \cap \mathbf{D}$	
A) All soda pops	B) All diet and all cola soda pops
C) All diet-cola soda pops	D) All diet or all cola soda pops
Answer: C	

87) A' ∩ C

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 non-diet soda pops in cans

D) All diet soda pops in cans

Answer: C

#### 88) $A \cap B \cap D$

A) All diet, all cola, and all caffeine-free soda pops C) All diet, caffeine-free, cola soda pops in cans

Answer: D

## 89) (A $\cup$ B) $\cup$ D

A) All diet, all cola, and all caffeine-free soda pops C) All soda pops

Answer: A

## 90) (A ∩ B) ∩ C'

A) All non-diet, non-cola soda pops not in cans C) All diet and all cola soda pops not in cans

Answer: D

## 91) (A $\cup$ D) $\cap$ C'

A) All non-cola soda pops not in cans

B) All diet, caffeine-free soda pops not in cans

C) All soda pops not in cans that are diet or caffeine-free

D) All non-diet, non-caffeine-free soda pops not in cans

### Answer: C

B) All soda pops not in cans

D) All diet, caffeine-free, cola soda pops

B) All soda pops not in cans

D) All diet, caffeine-free, cola soda pops

B) All cola soda pops not in cans

D) All diet-cola soda pops not in cans

### Describe the indicated set in words and find the set.

92) (P  $\circ$  C) , given the following information:

The table gives features of different dishwashers.							
	price	clean	clean	energy			
model	(dollars)	china	glassware	efficiency	noise level		
a	732	excellent	good	good	low		
b	469	excellent	good	fair	moderate		
c	568	excellent	good	good	high		
d	620	excellent	good	good	high		
e	570	good	fair	good	low		
f	354	excellent	fair	good	moderate		
g	494	good	fair	fair	moderate		
h	330	good	fair	fair	moderate		
i	232	fair	poor	good	moderate		

In the universal set  $U = \{a, b, c, ..., i\}$ , let the following characteristics be defined:

P = price is at or below \$469

C = does an excellent job of cleaning china

G = does an excellent job of cleaning glassware

E = has a good energy efficiency rating

F = has low noise level

A) Dishwashers costing \$469 or less that do an excellent job of cleaning china; {a, b, f}

B) Dishwashers costing \$469 or less that do an excellent job of cleaning china; {b, f}

C) Dishwashers that do an excellent job of cleaning china; {a, b, c, d, f}

D) Dishwashers costing \$469 or less and dishwashers that do an excellent job of cleaning china; {a, b, c, d, f}

Answer: B

## 93) P – (E ${}\cup$ C)' , given the following information:

The table gives features of different dishwashers							
	price	clean	clean	energy			
model	(dollars)	china	glassware	efficiency	water usage		
a	712	excellent	good	good	low		
b	455	excellent	good	fair	moderate		
c	554	excellent	good	good	high		
d	606	excellent	good	good	high		
e	556	good	fair	good	low		
f	385	excellent	fair	good	moderate		
g	480	good	fair	fair	moderate		
h	361	good	fair	fair	moderate		
i	263	fair	poor	good	moderate		

In the universal set  $U = \{a, b, c, ..., i\}$ , let the following characteristics be defined:

P = price is at or below \$455

C = does an excellent job of cleaning china

G = does an excellent job of cleaning glassware

E = has a good energy efficiency rating

F = has low water usage

- A) Dishwashers that cost \$455 or less and either have a good energy efficiency rating or do an excellent job of cleaning china; {h}
- B) Dishwashers that cost \$455 or less and have either a low energy efficiency rating or do an excellent job of cleaning china; {a, b, c, d, e, f, h, i}
- C) Dishwashers that cost \$455 or less and either have a good energy efficiency rating or do an excellent job of cleaning china; {b, f, i}
- D) Dishwashers that cost \$455 or less and have both a low energy efficiency rating and do an excellent job of cleaning china; {f}

Answer: C

## 94) (P $\circ$ L) – S' , given the following information:

The table gives the approximate nutritional value per serving of foods at a certain restaurant.

0 11				-	0	
		protein	fat	calcium	sodium	vitamin A
food	calories	(grams)	(grams)	(mg)	(mg)	(A.U.)
Chop Suey	240	23	16	75	1250	1100
Pizza (cheese)	120	15	9	220	691	2720
Bean Burrito	340	20	4	185	1230	80
Spaghetti & Meatballs	330	19	13	124	1009	1590
Pea Soup	250	7	7	158	900	850
Chicken Salad	210	33	8	28	360	100
Milkshake	270	3	13	145	98	420

Let:

 $C = \{m : m \text{ provides } 251 \text{ or more calories}\}$ 

 $P = \{m : m \text{ provides } 20 \text{ or more grams of protein}\}$ 

 $F = \{m : m \text{ provides } 10 \text{ or more grams of fat}\}$ 

 $L = \{m : m \text{ provides } 150 \text{ or more } mg \text{ of calcium}\}$ 

 $S = \{m : m \text{ provides } 1000 \text{ or more } mg \text{ of sodium}\}$ 

A = {m : m provides 1000 or more A.U. of vitamin A}

A) Foods that provide either 20 or more grams of protein or 150 or more mg of calcium, but have less than 1000 mg of sodium; {Pizza, Pea Soup, Chicken Salad}

B) Foods that provide both 20 or more grams of protein and 150 or more mg of calcium, but have less than 1000 mg of sodium; ∅

C) Foods that provide both 20 or more grams of protein and 150 or more mg of calcium, and have 1000 or more mg of sodium; {Chop Suey, Bean Burrito}

D) Foods that provide either 20 or more grams of protein or 150 or more mg of calcium, and have 1000 or more mg of sodium; {Chop Suey, Bean Burrito}

Answer: B

## 95) (P $\cup$ L) – (S $\cap$ C) , given the following information:

		protein	iat	calcium	soaium	Vitamin A
food	calories	(grams)	(grams)	(mg)	(mg)	(A.U.)
Chow Mein	240	23	16	75	1250	1100
Pizza (cheese)	120	15	9	220	705	2720
Bean Burrito	340	20	4	185	1230	80
Linguini & Meatballs	330	19	13	124	1009	1590
Pea Soup	250	7	7	158	900	850
Chicken Salad	210	33	8	28	360	100
Ice Cream	270	3	13	145	98	420
	-					

The table gives the approximate nutritional value per serving of foods at a certain restaurant.

Let:

C = {m : m provides 251 or more calories}

 $P = \{m : m \text{ provides } 20 \text{ or more grams of protein}\}$ 

 $F = \{m : m \text{ provides } 10 \text{ or more grams of fat}\}$ 

 $L = \{m : m \text{ provides } 150 \text{ or more } mg \text{ of calcium}\}$ 

 $S = \{m : m \text{ provides } 1000 \text{ or more } mg \text{ of sodium}\}$ 

A = {m : m provides 1000 or more A.U. of Vitamin A}

- A) Foods that have either 20 or more grams of protein or 150 or more mg of calcium, and also have either 1000 or more mg of sodium or 251 or more calories; {Chow Mein, Pizza, Bean Burrito, Pea Soup, Chicken Salad}
- B) Foods that have either 20 or more grams of protein or 150 or more mg of calcium, but do not have both 1000 or more mg of sodium and 251 or more calories; {Chow Mein, Pizza, Pea Soup, Chicken Salad}
- C) Foods that have both 20 or more grams of protein and 150 or more mg of calcium, but do not have both 1000 or more mg of sodium and 251 or more calories; Ø
- D) Foods that have either 20 or more grams of protein or 150 or more mg of calcium, but do not have either 1000 or more mg of sodium or 251 or more calories; {Chow Mein, Pizza, Pea Soup, Chicken Salad}

Answer: B

#### Shade the Venn diagram to represent the set.

96) A' ∩ B'



Answer: A

B) \_





Answer: A

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



Answer: B

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



Answer: B













Answer: A

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



Answer: A











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



Answer: A



B)







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



Answer: A







Write a description of the shaded region using the symbols A, B, C, v, n, –, and ' as needed. 106)

)			
$ \begin{array}{c} & & \\ & & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $	B) A – B	C) B – A'	D) A ∩ B′
107) A B $A \cup B$ Answer: B	B) A' ∩ B'	C) A – B	D) (A ∩ B)′
108) $A \rightarrow B$ Answer: A	B) (A ∩ B)'	C) A' ∩ B	D) B – A
109) $ \begin{array}{c}                                     $	B) A ∪ B ∩ C′	C) (A ∩ B) ∪ C'	D) (A ∪ B ∪ C)′
A) $B \cap (A \cap C)'$ Answer: D	B) B − (A ∩ C)	C) B' − (A ∪ B)	D) A' ∩ C' ∩ B



Use the Venn diagram below to find the number of elements in the region.

U 4 3 8 7 10 15 C			
112) n(A)	R) 17	$\Box$	12 (ת
Answer: B	<i>b)</i> 17		<i>D</i> ) 12
113) n(A $\cup$ B)	D) 14		
A) 21 Answer: C	B) 14	C) 29	D) 11
114) n(C')	D) 20		
A) 39 Answer: C	Б) 29	C) 24	D) 14
115) n(C – A) A) 13 Answer: C	B) 11	C) 20	D) 15
116) n(A ∩ C) A) 18 Answer: D	B) 2	C) 37	D) 10
117) n(A ∩ B ∩ C) A) 18 Answer: C	B) 44	C) 8	D) 16
118) n((A ∪ B) ∩ C) A) 11 Answer: D	B) 33	C) 14	D) 15
119) n((C ∪ B) – (A ∪ B) A) 2 Answer: C	)) B) 11	C) 15	D) 5

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.

120) B ⊂ (B ∩ A) A) True Answer: B	B) False
121) (B ∪ A) ⊂ B A) True Answer: B	B) False
122) $n(A \cup B) = n(A) - n(B)$ A) True Answer: B	B) False
123) n(A – B) = n(B – A) A) True Answer: B	B) False
124) If $B \subseteq A$ , $n(B) = n(A - B)$ . A) True Answer: B	B) False
125) If $B \subseteq A$ , $n(B) = n(A) - n(A - B)$ . A) True Answer: A	B) False
126) $n(A \circ B) = n(B \circ A)$ A) True Answer: A	B) False
127) $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ A) True Answer: A	B) False
128) $n(A \cap B) = n(A) - n(B)$ A) True Answer: B	B) False
129) $n(A \cup B) + n(A \cap B) = n(A) + n(B)$ A) True Answer: A	B) False

Determine which labeled sections make up the indicated set.



134)  $n(A \cup B \cup C) = 21$  $n(A \cap B) = 4$  $n(A \cap C) = 5$ n(A - B) = 6 $n(C \cap B) = 8$  $n(A \cap B \cap C) = 2$  $n(C - (A \cup B)) = 2$ A) n(A) = 8, n(B) = 15, n(C) = 13B) n(A) = 8, n(B) = 11, n(C) = 15C) n(A) = 10, n(B) = 13, n(C) = 13D) The information is inconsistent or incomplete. Answer: C 135) n(A - C) = 10n(C - A) = 2 $n(A \cup C) = 22$  $n(A \cap B) = 10$  $n((C \cap A) - B) = 4$  $n((A \cap B) - C) = 4$  $n(B - (A \cup C)) = 3$  $n(B \cap C) = 7$ A) n(A) = 16, n(B) = 18, n(C) = 12B) n(A) = 12, n(B) = 25, n(C) = 20C) n(A) = 20, n(B) = 14, n(C) = 12D) The information is inconsistent or incomplete. Answer: C

136) $n(A - C) = 10$	
n(C - A) = 3	
$n(A \cap B) = 8$	
$n(C \cap A) = 8$	
$n(C \cap B) = 6$	
n(B - A) = 8	
$n(A \cap B \cap C) = 4$	
A) $n(A) = 18$ , $n(B) = 16$ , $n(C) = 11$	B) $n(A) = 22$ , $n(B) = 20$ , $n(C) = 15$
C) $n(A) = 11$ , $n(B) = 27$ , $n(C) = 18$	D) The information is inconsistent or incomplete.
Answer: A	
137) (A $\circ$ B) = Ø	
$n(A \cap C) = 8$	
n(C - B) = 14	
n(B - C) = 6	
n(A - C) = 5	
$n(B \cup C) = 25$	
A) $n(A) = 5$ , $n(B) = 19$ , $n(C) = 27$	B) $n(A) = 13$ , $n(B) = 11$ , $n(C) = 24$
C) $n(A) = 13$ , $n(B) = 11$ , $n(C) = 19$	D) The information is inconsistent or incomplete.
Answer: C	

#### Solve the problem.

138) A local television station sends out questionnaires to determine if viewers would rather see a documentary, an interview show, or reruns of a game show. There were 450 responses with the following results:

135 were interested in an interview show and a documentary, but not reruns.
18 were interested in an interview show and reruns but not a documentary.
63 were interested in reruns but not an interview show.
108 were interested in an interview show but not a documentary.
45 were interested in a documentary and reruns.
27 were interested in an interview show and reruns.
36 were interested in none of the three.

How many are inte	rested in exactly one kind of s	how?	
A) 216	B) 206	C) 226	D) 196
Answer: A			
139) A survey of 240 fam	nilies showed that		
91 had a dog;			
70 had a cat;			
31 had a dog and a	ı cat;		
91 had neither a ca	t nor a dog nor a parakeet;		
7 had a cat, a dog,	and a parakeet.		
How many had a p	arakeet only?		
A) 24	B) 34	C) 29	D) 19
Answer: D			

140) A survey of a group of 117 tour	rists was taken in St. Louis. Tl	he survey showed the followi	ng:
66 of the tourists plan to visit G	ateway Arch;		
47 plan to visit the zoo;			
10 plan to visit the Art Museum	n and the zoo, but not the Gat	eway Arch;	
14 plan to visit the Art Museum	n and the Gateway Arch, but :	not the zoo;	
19 plan to visit the Gateway Ar	ch and the zoo, but not the A	rt Museum;	
7 plan to visit the Art Museum	n, the zoo, and the Gateway A	Arch;	
16 plan to visit none of the three	e places.		
How many plan to visit the Art	Museum only?		
A) 36	B) 101	C) 47	D) 14
Answer: D			

141) A survey of 128 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.

 $\begin{array}{ll} n(A) = 45 & n(A \cap B) = 12 \\ n(B) = 55 & n(A \cap C) = 15 \\ n(C) = 40 & n(B \cap C) = 23 \\ n(A \cap B \cap C) = 2 \end{array}$ 

How many students	s were not taking any of these	e electives?	
A) 46	B) 38	C) 10	D) 36
Answer: D			

## Find the cardinal number of the indicated set by referring to the given table.

142)	H ∪ A,						
	given the	e following	table:				
	U.S	. Production	n (in Thousand	s of Tons) of Co	ertain Nuts	-	
	Year	Pecans (P)	Almonds (A)	Walnuts (W)	Hazelnuts (H)	•	
	1993 (T)	181	584	232	41		
	1994 (F)	99	585	232	21		
	1995 (V)	134	304	229	39		
	1996 (S)	111	412	205	17		
	A) 543		B) 1	1038	C) 20	)03	D) 625

Answer: C

## 143) V ∩ W,

given the following table:

U.S. Production (in Thousands of Tons) of Certain Nuts					
Pecans (P)	Almonds (A)	Walnuts (W)	Hazelnuts (H)		
181	584	232	41		
99	587	232	21		
134	304	234	39		
111	412	205	21		
_	B) 3	368	C) 23		
	5. Production Pecans (P) 181 99 134 111	Production (in Thousand           Pecans (P)         Almonds (A)           181         584           99         587           134         304           111         412	B. Production (in Thousands of Tons) of Control         Pecans (P)       Almonds (A)       Walnuts (W)         181       584       232         99       587       232         134       304       234         111       412       205         B) 368       368		

Answer: C

144) A – (F  $\cup$  S),

given the	e following	table:				
U.S. Production (in Thousands of Tons) of Certain Nuts						
Year	Pecans (P)	Almonds (A)	Walnuts (W)	Hazelnuts (H)		
1993 (T)	184	584	232	41		
1994 (F)	99	587	232	21		
1995 (V)	134	304	230	39		
1996 (S)	111	412	205	22		
A) 759	)	B) 8	388	C) 175		
Answer:	В					

# 145) V $\cap$ (P $\cup$ W),

given the following table:

0	0						
U.S. Production (in Thousands of Tons) of Certain Nuts							
Year	Pecans (P)	Almonds (A)	Walnuts (W)	Hazelnuts (H)			
1993 (T)	183	584	232	41			
1994 (F)	99	586	232	21			
1995 (V)	134	304	235	39			
1996 (S)	111	412	205	22			
A) 158	3	B) 3	369	C) 34			

Answer: B

Show that the set has cardinal number of by establishing a one-to-one correspondence between the natural numbers and the given set. Be sure to indicate the general correspondence.

D) 999

146) {3, 6, 9, 12	2,}							
A) 1,	2, 3, 4,, n,	B)	0,	1,	2,	3,	,	n,
ţ	I I I I		Ĵ	1	ţ	ţ		1
3,	6, 9, 12,, 3n,		3,	6,	9,	12,	,	3n,
C) 1,	2, 3, 4,, n,	D)	1,	2,	3,	4,	,	n,
ţ	I I I I		ţ	1	1	ţ		1
3,	6, 9, 12,, n,		3,	6,	9,	12,	,	4n,
Answer: A	A							
147) {0, 3, 6, 9,	12,}							
A) 1,	2, 3, 4,, n,	B)	1,	2,	3,	4,	,	n,
ţ	I I I I		ţ	1	ţ	ţ		ţ
0,	3, 6, 9,, 3n – 3,		0,	3,	6,	9,	,	3n – 1,
C) 1,	2, 3, 4,, n,	D)	1,	2,	3,	4,	,	n,
ţ	I I I I I		ţ	1	1	ţ		ţ
0,	3, 6, 9,, 3n,		0,	3,	6,	9,	,	3n + 3,
Answer: A	A							
148) {1, 5, 9, 13	8, 17,}							
A) 1,	2, 3, 4, 5,, n,	B)	1,	2,	3,	4,	5,	, n,
ţ	1 I I I I I I		ţ	1	1	ţ	1	t
1,	5, 9, 13, 17,, 4n + 3,		1,	5,	9,	13,	17,	,4n – 3,
C) 1,	2, 3, 4, 5,, n,	D)	1,	2,	3,	4,	5,	, n,
ţ	I I I I I I I		ţ	1	1	ţ	1	t
1,	5, 9, 13, 17,, 3n – 1,		1,	5,	9,	13,	17,	, 3n + 1,
Answer: 1	В							

149) 
$$\{8, 13, 18, 23, 28, ...\}$$
  
A) 1, 2, 3, 4, 5, ..., n, ...  
t t t t t t t t t  
8, 13, 18, 23, 28, ..., 5n + 3, ...  
C) 1, 2, 3, 4, 5, ..., n, ...  
t t t t t t t t  
8, 13, 18, 23, 28, ..., 4n - 2, ...

Answer: A

Answer: B

Answer: B

152)  $\{1, 4, 9, 16, 25 \dots\}$ A) 1, 2, 3, 4, 5, ..., n, ... I I I I I I I I 1, 4, 9, 16, 25, ..., 2n<sup>2</sup>, ... C) 1, 2, 3, 4, 5, ..., n, ... I I I I I I 1, 4, 9, 16, 25, ..., n<sup>3</sup>, ... Answer: D B) 1, 2, 3, 4, 5, ..., n, ... t t t t t t8, 13, 18, 23, 28, ..., 5n + 2, ... D) 1, 2, 3, 4, 5, ..., n, ... t t t t t8, 13, 18, 23, 28, ...,  $n_{r}$  ...

B) 1, 2, 3, 4, 5, ..., n, ...  

$$1$$
 1 1 1 1 1  
 $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ , ...,  $\frac{1}{n+1}$ , ...  
D) 1, 2, 3, 4, 5, ..., n, ...  
 $1$  1 1 1 1 1  
 $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ , ...,  $\frac{1}{n-1}$ , ...

B) 1, 2, 3, 4, 5, ..., n, ...  

$$1$$
  $1$   $1$   $1$   $1$   $1$   $1$   
 $\frac{1}{3}$ ,  $\frac{3}{5}$ ,  $\frac{5}{7}$ ,  $\frac{7}{9}$ ,  $\frac{9}{11}$ , ...,  $\frac{2n-1}{2n+1}$ , ...  
D) 1, 2, 3, 4, 5, ..., n, ...  
 $1$   $1$   $1$   $1$   $1$   $1$   
 $\frac{1}{3}$ ,  $\frac{3}{5}$ ,  $\frac{5}{7}$ ,  $\frac{7}{9}$ ,  $\frac{9}{11}$ , ...,  $\frac{3n-1}{n+1}$ , ...

B)	1,	2,	3,	4,	5,	, n,
	ţ	1	ţ	ţ	1	ţ
	1,	4,	9, 1	6,	25,	, $n^4$ ,
D)	1,	2,	3,	4,	5,	, n,
	ţ	1	ţ	ţ	ţ	ţ
	1,	4,	9, 1	6,	25,	, n <sup>2</sup> ,

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153) {5, 25,	125,6	525,	}											
A)	1,	2,	3,	4,	,	n,	 B	) 1,	,	2,	3,	4,	., n,	
	ţ	ţ	ţ	ţ		1		ţ		1	ţ	t	ţ	
	5,	25,	125,	625,	,	n <sup>5</sup> ,		5,	,	25,	125,	625,	., 5n,	
C)	1,	2,	3,	4,	,	n,	 D	) 1,	,	2,	3,	4,	., n,	
	Ţ	Ţ	ţ	ţ		ţ		1		ţ	ţ	Ţ	ţ	
	5,	25,	125,	625,	,	5 <sup>n</sup> ,		5,	,	25,	125,	625,	., 5 <sup>2n</sup> ,	
Answ	er: C													

We give an expression describing the number that corresponds to the natural number n. Use this expression to describe a one-to-one correspondence between the natural numbers and one of its subsets.

154) 4n – 1

A)	1, 2, 3, 4, 5,,	n,	B)	1, 2,	3,	4, 5,,	n,
	I I I I I	ţ		t t	Ĵ	t t	t
	2, 6, 10, 14, 18,	4n – 1,		1, 5,	9,	13, 17,	4n – 1 ,
C)	1, 2, 3, 4, 5,,	n,	D)	1, 2,	3,	4, 5,,	n,
	I I I I I	Ţ		t t	Ĵ	t t	t
	3, 7, 11, 15, 19,	4n,		3, 7,	11,	15, 19,	4n <b>-</b> 1,
	-						

Answer: D

Describe a one-to-one correspondence between the given set and one of its proper subsets. For example, if we gave you the set {3, 5, 7, 9, 11, ...}, the nth term is 2n +1. You could then write the correspondence by matching the elements of {3, 5, 7, 9, 11, ...} with the elements of the subset {5, 7, 9, 11, 13, ...}. The general correspondence would match 2n + 1 with 2n + 3. 155) {5, 6, 7, 8, ...}

B)	5, 6, 7, 8,, n + 5,
	t t t t t
	4, 5, 6, 7,, n + 3,
D)	5, 6, 7, 8,, n + 4,
	t t t t t
	4, 5, 6, 7,, $n + 3$ ,
B)	6, 8, 10, 12,, 2n + 4,
	t t t t t
	7, 9, 11, 13,, 2n + 6,
D)	6, 8, 10, 12,, 2n + 4,
	1 1 1 1 1
	8, 10, 12, 14,, 2n + 6,
	B) D) B) D)

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