MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Use inductive reasoning to predict the next line in the pattern.

1) $9 \times 9 = 81$

 $99 \times 99 = 9801$

 $999 \times 999 = 998,001$

A) 999 × 9999 = 99,980,001

C) $9999 \times 9999 = 1,000,001$

B) 9999 × 9999 = 999,001

D) 9999 × 9999 = 99,980,001

2) $(1 \times 9) - 5 = 4$

 $(21 \times 9) - 5 = 184$

 $(321 \times 9) - 5 = 2884$

A) $(4321 \times 9) - 5 = 3883$

C) $(4321 \times 9) - 5 = 38,884$

B) $(432 \times 9) - 5 = 38,884$

D) $(4321 \times 9) - 5 = 28,884$

3) $6 \times 8 = 7 \times 9 - 15$

 $8 \times 10 = 9 \times 11 - 19$

A) $10 \times 12 = 11 \times 13 - 21$

C) $10 \times 12 = 11 \times 13 + 21$

B) $10 \times 12 = 13 \times 19 - 23$

D) $10 \times 12 = 11 \times 13 - 23$

4) $(7 \times 1) \times (2 \times 1) = 14$

 $(7 \times 10) \times (2 \times 2) = 280$

 $(7 \times 100) \times (2 \times 3) = 4200$

A) $(7 \times 1000) \times (2 \times 4) = 5600$

C) $(7 \times 1000) \times (2 \times 4) = 63,000$

B) $(7 \times 1000) \times (2 \times 4) = 49,000$

D) $(7 \times 1000) \times (2 \times 4) = 56,000$

5) $9 \times 10 = 11 \times 12 - (9 + 10 + 11 + 12)$

 $10 \times 11 = 12 \times 13 - (10 + 11 + 12 + 13)$

A) $11 \times 12 = 13 \times 14 - (11 + 12 + 13 + 14)$

B) $12 \times 13 = 14 \times 15 - (11 + 10 + 9 + 8)$

C) $12 \times 13 = 14 \times 15 - (12 + 13 + 14 + 15)$

D) $11 \times 12 = 13 \times 14 - (9 + 10 + 11 + 12 + 13 + 14)$

6) _____

1) _____

2) _____

3) _____

4) _____

5) _____

6) 18 + 81 = 99

19 + 91 = 110

A) 20 + 101 = 162

B) 20 + 101 = 121

C) 88 + 33 = 121

D) 101 + 20 = 121

7) 40 - 9 = 31

400 - 89 = 311

4000 - 789 = 3211

A) 400,000 - 6789 = 33,211

C) 40,000 - 6789 = 33,211

B) 4000 - 6789 = 33,211

D) 40,000 - 6789 = 393,211

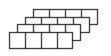
Draw the next figure in the pattern.

8)

8) _____

7) _____

C)







9)



A)



C)



9) _____

10) _____

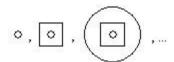
11) _____

10)





11)



A)





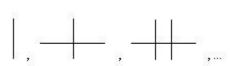
C)



D)



12)



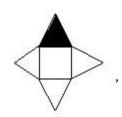




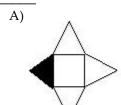
D)



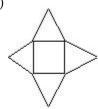
13)



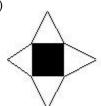
12) _____



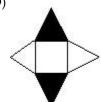




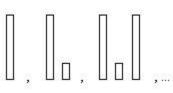
B)



D)



14)



A)



B)



C)





Use inductive reasoning to predict the next number in the sequence.

- 15) 2, 8, 14, 20, 26
 - A) 28

B) 31

C) 32

D) 38

- 16) 27, 23, 19, 15, 11
 - A) 4

B) 2

C) 7

D) 0

- 17) 6, -18, 54, -162, 486
 - A) 810

- B) 810
- C) 1458
- D) 1458

- 18) 0, 4, 4, 0, -4, ...
 - A) 8

B) 4

C) - 4

D) 0

- 20) 3, 5, 6, 10, 12, 20, ...
 - A) 18

B) 24

C) 30

- D) 40
- 20) ____

21) ____

19) _____

14) _____

15) _____

16) _____

17) ___

18) _

Solve the problem using inductive reasoning.

21) Find the next term in the following sequence.

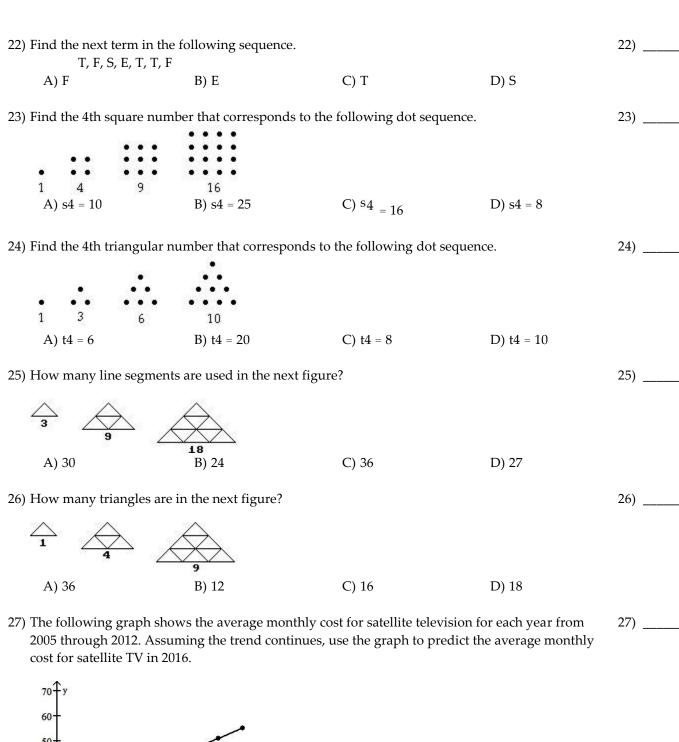
F, S, S, M, T

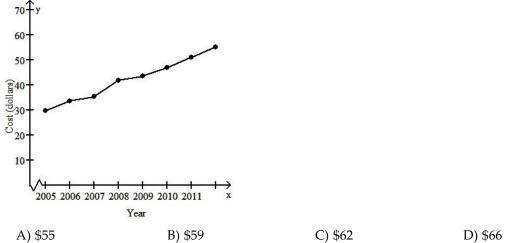
A) T

B) F

C) W

D) S





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

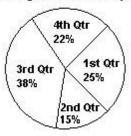
28) How many rectangles are there in the last two figures?	28)
1 rectangle	
3 rectangles	
?rectangles	
? rectangles	
29) How many rectangles are there in the last two figures?	29)
1 rectangle	
3 rectangles	
? rectangles	
? rectangles	
	20)
30) In how many ways can you exactly cover the last two diagrams with "dominoes" that are just the size of two small squares?	30)
1way	
2 ways	
? ways	
? ways	
	24)
31) How many line segments are determined by joining dots on the last two circles?	31)
3 segments 6 segments ? segments ? segments	ar I combrat
32) Find the number of games played in a round robin tournament for the given numbers of teams. In a round robin tournament every team plays every other team once.	Number of treems Number Find the teams
	numbet teams games 5 tagens in a roung robins
	7 teams tournament
	involving n Loo

teams. Find the number of games played in a round robin tournam ent involvin g 16 teams.	32)				
	LE CHOICE. Choose the the answer by rounding.	one alternative that best	completes the statement	or answers the questi	on.
	98 + 37 + 66 + 62 + 18				33)
,	A) 280	B) 281	C) 300	D) 290	,
34)	57 - 24				34)
,	A) 40	B) 80	C) 30	D) 33	,
35)	948 + 809 + 649 + 352 + 105	5			35)
	A) 2800	B) 2900	C) 2860	D) 2863	
36)	870 - 137				36)
,	A) 1000	B) 733	C) 700	D) 800	/
37)	816 - 557				37)
,	A) 300	B) 259	C) 200	D) 260	
38)	122 × 6929				38)
50)	A) 140,000	B) 1,200,000	C) 700,000	D) 600,000	
39)	61,688 ÷ 484				39)
0)	A) 1100	B) 120	C) 1200	D) 110	<i></i>
40)	32,478				40)
10)	476				10)
	A) 50	B) 500	C) 60	D) 600	
Estimate	the answer to the problem				
	Each gallon of shingle stair		How many gallons should	you buy to cover	41)
	658 square feet? A) 6 gal	B) 4 gal	C) 5 gal	D) 7 gal	
40)					10)
42)	One cook can make enoug 1239 people a night?	n rood for 350 people a ni	gnt. How many cooks are	needed to feed	42)
	A) 3 cooks	B) 6 cooks	C) 4 cooks	D) 5 cooks	
43)	David's company has to sh	nip 1982 boxes of sprinkle	rs. If a truck can hold 550	boxes, how many	43)
-3)	trucks does he need to ship	-		, -··· -,	- /
	A) 5 trucks	B) 2 trucks	C) 4 trucks	D) 3 trucks	

44)	A particular freight elevat wood can be safely carried		oounds. How many 120-pe	ound bundles of	44)
	A) 5 bundles	B) 7 bundles	C) 8 bundles	D) 9 bundles	
45)	Each gallon of porch and cover 961 square feet?	deck paint covers 200 squ	are feet. How many gallo	ns are needed to	45)
	A) 4 gal	B) 6 gal	C) 5 gal	D) 3 gal	
46)	Jane runs 1 2 miles a day. Jane runs in 5 8 days.	Without finding the exac	t answer, estimate the tota	al number of miles	46)
	A) 1200 mi	B) 600 mi	C) 500 mi	D) 3000 mi	
47)	An appliance store sells 2 total amount of money the	_	_		47)
	A) \$24,000	B) \$16,000	C) \$18,000	D) \$27,000	
48)	James' drive from home to		•	-	48)
	then how many miles doe A) 1750 mi	B) 1500 mi	me to work and back in of C) 900 mi	ne montn? D) 1200 mi	
-	A mobile library has 893 b many books, on average,			library, then how	49)
	A) 60 books	B) 50 books	C) 55 books	D) 46 books	
-	Ingred is planning a vacate Denver, Colorado, totals sand she estimates a total of planning on staying four	6153. Car rental is \$56 per food, ga	er day and her hotel is a to as, and miscellaneous item	otal of \$113 per day,	50)
	A) \$370	B) \$1030	C) \$1280	D) \$1080	
	the answer from the table The profit earnings for AF yearly earnings for 2012 a \$410,000, what were the e	BC company are reported re shown in the pie chart	. If the total earnings for th		51)
	% Earnings of ABC C	ompany			
	4th Qtr 40% 1st 0 15% 3rd Qtr 25% 2nd Q 20%				
	A) \$164,000	B) \$205,000	C) \$102,500	D) \$82,000	

52) The profit earnings for XYZ company are reported quarterly. The earnings as a percentage of the yearly earnings for 2012 are shown in the pie chart. If the earnings in the first quarter were \$58,000, what were the earnings for the whole year?

% Earnii?gs of XYZ Company



- A) \$290,000
- B) \$29,000
- C) \$232,000
- D) \$116,000

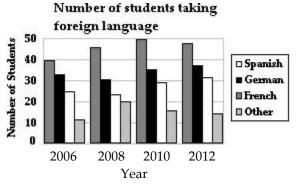
53) ____

53) A retail store has items such that they fall under the categories of clothes, housewares, jewelry, and other. The percentage floor space allocated for displaying each category of items is shown in the pie chart. If the floor space allocated to clothes is 22,000 ft², what is the floor space allocated to jewelry?

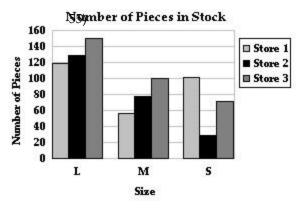
% Floor space



- A) $_{11,000}$ ft²
- B) 66,000 ft²
- C) $_{44,000}$ ft²
- D) $_{5500}$ ft²
- 54) The number of students at Alder High School who studied foreign languages in different years is shown in the bar graph. What is the total number of students who studied a foreign language in 2012? (Assume no student studied two foreign languages).



- A) 90 students
- B) 150 students
- C) 130 students
- D) 170 students
- 55) A retail chain has three stores that are carrying various sizes of a particular dress. The number of pieces of each size that a store has is shown in the graph below. If Store 1 sold 30 pieces of the large (L) size, how many does it still have?



- A) 120 pieces
- B) 1150 pieces
- C) 170 pieces
- D) 90 pieces

D) 1

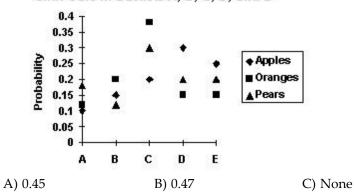
D) \$31

56) __

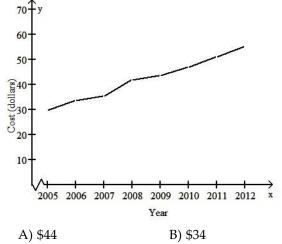
57) ___

56) The probability of finding apples, oranges, and pears in each of baskets A, B, C, D, and E is shown in the graph given below. What is the probability of finding apples in one of the baskets A, B, or C?

Probabilities of Finding Apples, Oranges, and Pears in Baskets A, B, C, D, and E



57) The graph shows the average monthly cost of a wireless phone service for the years 2005 through 2012. Estimate the average monthly cost of this wireless phone service in 2006.



58) The number of calories in different food items are given below. If Jeanne had a serving of salad and two slices of bread for lunch, what was her calorie intake?

C) \$37

Food iten58)	Calories
Glass of milk	155
Bowl of cereal	115
Slice of bread	60
Fruit bowl	65
Serving of salad	40

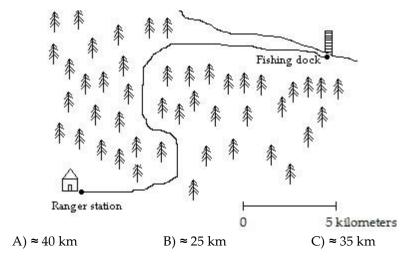
- A) 160 calories
- B) 200 calories
- C) 140 calories
- D) 100 calories
- 59) In a shop that sells a variety of nuts, the prices of some items are as given below. If Sarah buys 2 lb of cashews, 1 lb of walnuts, and 2 lb of raisins, how much did she have to pay?

Item	Cost/lb
Almonds	\$4.30
Walnuts	\$3.80
Cashews	\$4.80
Pecans	\$3.80
Raisins	\$3.50

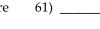
- A) \$27.70
- B) \$16.60
- C) \$24.20
- D) \$20.40

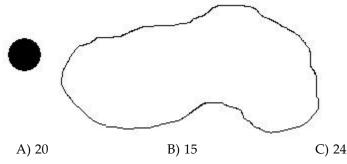
Solve the problem.

- 60) Below is a map of a trail through a forest preserve. Using the scale on the map, estimate the distance of the route starting at the fishing dock and ending at the ranger station.
- 60) _____

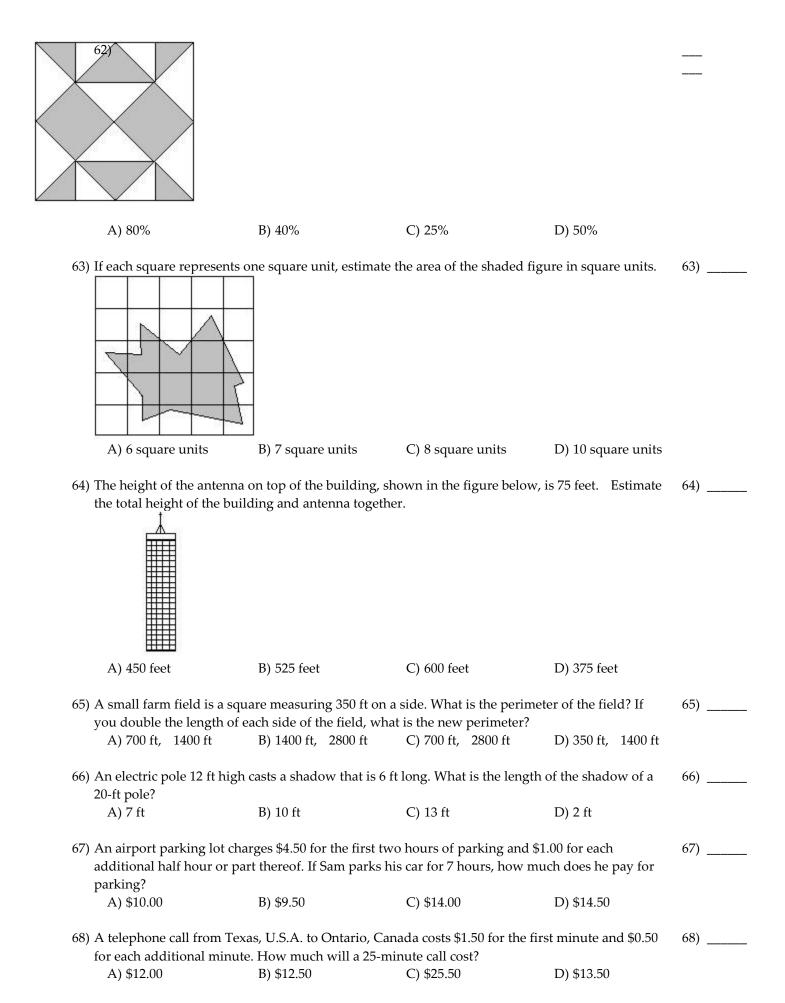


- D) ≈ 20 km
- 61) Estimate the maximum number of smaller figures (at left) that can be placed in the larger figure (at right) without the small figures overlapping.





- D) 17
- 62) Estimate the percent of area that is shaded in the following figure.



69) Jill took five courses th (3.5 points), an A (4 po was her grade in the fi	oints), and a B+ (3.5 points	credit hours. She received s) in four of the courses. If		69)
A) B+ (3.5 points)	B) D (1 point)	C) B (3 points)	D) C+ (2.5 points)	
70) One gallon of a drivew needed to cover a 900	•	of 180 ^{ft 2} . How many ga	allons of the sealant are	70)
A) 2 gal	B) 8 gal	C) 5 gal	D) 7 gal	
71) Margaret is saving \$21 wants. The bracelet co be able to buy the brace	sts \$551. What is the mini	an have enough money to mum number of weeks sh	2	71)
A) 27 weeks	B) 28 weeks	C) 26 weeks	D) 25 weeks	
72) To make orange juice in 16 ounces of water. A) 12.5 teaspoons		, you need to mix 2.5 teas owder do you need for 1 C) 5 teaspoons		72)
73) The cost of gasoline is Approximately how m A) \$57.20		or gives a mileage of 35 mi poline for a trip of 491 mile C) \$79.20		73)
74) A rectangle has area or measurements give the	-	ength and width are who	e numbers. Which	74)
A) 1 m by 2646 m	B) 6 m by 441 m	C) 7 m by 378 m	D) 42 m by 63 m	
75) How many triangles (of any size) are there in th	ne figure?		75)
A) 16	B) 13	C) 15	D) 19	
76) How many triangles (of any size) are there in th	e figure?		76)
A) 12	B) 10	C) 14	D) 9	
77) How many cubes (of a	ny size) are there in the f	igure?		S

7	7
/	/ 1

A) 15

B) 10

C) 9

D) 14

78) Missy and Adam work at different jobs. Missy earns \$7 per hour and Adam earns \$5 per hour. They each earn the same amount per week but Adam works 2 more hours. How many hours a week does Adam work?

A) 7 hr

B) 11 hr

C) 9 hr

D) 5 hr

79) A boxer takes 3 drinks of water between each round for the first four rounds of a championship fight. After the fourth round he starts to take his three drinks plus one additional drink between each of the remaining rounds. If he continues to increase his drinks by 1 after each round, how many drinks will he take between the 14th and 15th round?

79) _____

A) 15 drinks

B) 14 drinks

C) 10 drinks

D) 19 drinks

80) An average library contains at least 50 and at most 250 books. How many library owners must be polled to be certain that at least two owners have the same number of books in their libraries?

80) _____

A) 200 owners

B) 202 owners

C) 201 owners

D) 203 owners

81) An average newspaper contains at least 16 pages and at most 87 pages. How many newspapers must be collected to be certain that at least two newspapers have the same number of pages?

81) _____

A) 72 newspapers

B) 71 newspapers

C) 70 newspapers

D) 73 newspapers

82) A cell has at least 3 and at most 47 nucleii. How many cells must a scientist view under his microscope to be certain that at least two cells have the same number of nucleii?

82) _____

A) 45 cells

B) 44 cells

and 36 inches high, if the girth of the box is 24 inches?

C) 46 cells

D) 47 cells

A yardstick measures $\frac{1}{2}$ by 2 by 36 inches. How many yardsticks will fit in a box 2 inches wide

83) _____

A) 10 yardsticks

B) 40 yardsticks

C) 60 yardsticks

D) 48 yardsticks

84) $\frac{1}{4}$ by 3 by 36 inches. How many yard sticks will fit in a

84) _____

A yardstick measures ⁴ by 3 by 36 inches. How many yard sticks will fit in a box 3 inches wide and 36 inches high, if the girth of the box is 30 inches?

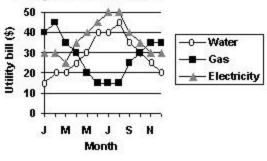
- A) 24 yardsticks
- B) 120 yardsticks
- C) 12 yardsticks
- D) 96 yardsticks

Use the table or graph to answer the question.

85) Amy graphed her utility bills for the last year for her records. Estimate the total amount Amy paid for her utilities for the month of January.

85) _____

Utility Bills for the Year



A) \$125

B) \$105

C) \$75

D) \$85

(research 86)

,

product,

and

consultin

g) as

shown in

the pie

chart.

The

profits

from the

product

group

were

further

categoriz

ed as

shown in

the

second

pie chart.

How

much

was the

profit

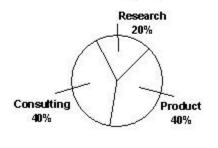
from

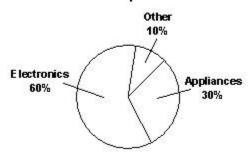
applianc

es?

% Profit from groups

% Profit from products





- A) \$720,000
- B) \$1,800,000
- C) \$900,000
- D) \$1,200,000

87) A company decides the bonus it gives to its employees on the basis of the number of years of service as shown in the following table:

Number of years of service	Bonus
1-3	5% of salary
3-8	8% of salary
8-15	13% of salary
	20% of salary

If Anne gets a bonus of \$4240 after working 4 years for this company, what is her salary?

A) \$42,400	B) \$10,600		C) \$26,500	D) \$53,000	
88) The number of vacat years of service as sh	, ,	•	or its employees o	depends on the number	C
Number of	years of service 1	1-5 5-3	10 10 or more		

If Jack took 15 vacation days last year, what is the minimum number of years he must have worked for the company?

A) 8

B) 10

Number of vacation days 4

C) 11

20

12

D) 9

89) The following chart shows an appliance store's average percent profit margin on certain items:

89) ____

88) ___

Product category	Average profit margin,%
Washer/Dryer	17
Refrigerator	13
Stove	16
Microwave	40

What is the average profit for the store if it lists the price of a particular refrigerator at \$800?

A) \$320.00

B) \$104.00

C) \$92.04

D) \$640.00

Complete the magic (addition) square.

90) Use each number 13, 14, 15, 16, 17, 18, 19, 20, and 21 once.

90) _____

16		
15	17	- 60
20	13	18

A)

16	19	14
15	17	21
20	13	18

B)

PI XB ED ED		
16	19	21
15	17	14
20	13	18

C)

16	21	14
15	17	19
20	13	18

D)

	_	
16	21	19
15	17	14
20	13	18

91) Use each number 12, 13, 14, 15, 16, 17, 18, 19, and 20 once.

91) _____

19		15
12	16	-8
	18	13

A)

19	14	15
12	16	20
17	18	13

B)

19	17	15
12	16	14
20	18	13

C)	19 14 15 12 16 17 20 18 13	D)	19 20 15 12 16 14 17 18 13	
92) Use ea	ach number 22, 23, 24, 25, 26, 27, 28, 29, and 30	once.		92)
25	5 23 26 28 22			
A)		B)		
	25 27 23 24 26 28 29 22 30		25 29 23 24 26 28 27 22 30	
C)		D)		
	25 30 23 24 26 28 27 22 29		25 30 23 24 26 28 29 22 27	
93) Use ea	ach number 20, 21, 22, 23, 24, 25, 26, 27, and 28	once.		93)
	22 23 24 28 21			
A)		B)		
	25 22 23 20 24 28 27 26 21		26 22 23 20 24 28 25 27 21	
C)		D)		
	27 22 23 20 24 28 25 26 21		27 22 23 26 24 28 20 25 21	
94) Use ea	ach number 26, 27, 28, 29, 30, 31, 32, 33, and 34	once.		94)
27	30 28			
A)		31 33 27	26 32 30 28 34 29	

B)

29	32
30	28
34	26
	29 30 34

C)

31	29	33
32	30	28
27	34	26

D)

31	26	33
32	30	28
27	34	29

95) ____

95) Use each number 60, 61, 62, 63, 64, 65, 66, 67, and 68 once.

61		65
	8-8	60
63	62	- 1

A)

61	67	65
68	64	60
63	62	66

B)

61	66	65
68	64	60
63	62	67

C)

(2)		- 6
61	67	65
68	66	60
63	62	64

D)

61	66	65
67	64	60
63	62	68

```
1) D
 2) C
 3) D
 4) D
 5) A
 6) B
 7) C
 8) C
 9) D
10) A
11) A
12) A
13) A
14) B
15) C
16) C
17) C
18) C
19) C
20) B
21) C
22) D
23) C
24) D
25) A
26) C
27) D
28) 5 + 4 + 3 + 2 + 1 = 15 rectangles
   8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 36 rectangles
29) 6 + 5 + 4 + 3 + 2 + 1 = 21 rectangles
   10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 55 rectangles
30) 8 ways
   34 ways
31) 4 + 3 + 2 + 1 = 10 segments
   6 + 5 + 4 + 3 + 2 + 1 = 21 segments
32) 6 teams: 5 + 4 + 3 + 2 + 1 = 15 games
   7 teams: 6 + 5 + 4 + 3 + 2 + 1 + = 21 games
              n(n-1)
   n teams:
                        games
    16 teams: 120 games
33) D
34) A
35) A
36) D
37) C
38) C
39) B
40) C
41) A
42) A
```

43) C

- 44) D
- 45) C
- 46) B
- 47) A 48) D
- 49) B
- 50) B
- 51) C
- 52) C
- 53) A
- 54) C
- 55) D
- 56) A
- 57) B
- 58) A
- 59) D
- 60) B
- 61) A
- 62) D
- 63) C
- 64) B
- 65) B
- 66) B
- 67) D
- 68) D
- 69) C
- 70) C
- 71) A
- 72) B
- 73) B
- 74) D
- 75) A
- 76) C
- 77) A
- 78) A
- 79) B
- 80) B
- 81) D
- 82) C
- 83) D
- 84) B
- 85) D
- 86) A
- 87) D
- 88) B
- 89) B
- 90) C 91) A
- 92) D
- 93) C
- 94) D
- 95) B