MICROCOPY RESOLUTION TEST CHART

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DOCUMENT RESUME

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ABSTRACT
         A set of 58 problems that may be solved by using
lists is presented. This set is part of the Mathematical Problem
Solving Project. The problems are coded for three levels of
difficulty and are designed for students in the intermediate grades.
Answers are provided. (MP)

USING

LISTS

B 01

P	N
10	0
5	1
0	2

P is for pennies
N is for nickels

B 0 2   ans. 6

A C D B
A C G B
A F E B
A F D B
A H E B
A H G B

How many ways can you make change for a dime?

B 0 2   An ant crawls from A to B.
         How many different 3-legged
         trips can it travel?

Hint: Where do you start?
         Where do you end?
         From the starting place how
         many more letters do you go
         through on a 3-legged trip?
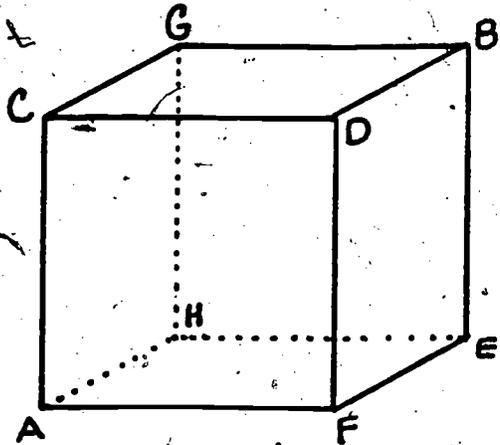
B 0 3

A	B
0	10
1	9
2	8
3	7
4	6
5	5
6	4
7	3
8	2
9	1
10	0

there is a difference in arrangement because the plates are labeled.

B 0 4

| 1	3	5	7	9		
1	0	0	0	1		
0	1	0	1	0		
3	0	0	1	0	*	7 + 1 + 1 + 1
2	1	1	0	0	*	5 + 3 + 1 + 1
1	3	0	0	0	*	3 + 3 + 3 + 1

You have 10 beans to be placed on two plates labeled A and B.
In how many different ways can these beans be placed on the
plates? Think of all the ways, including placing all the beans
on one of the two plates.
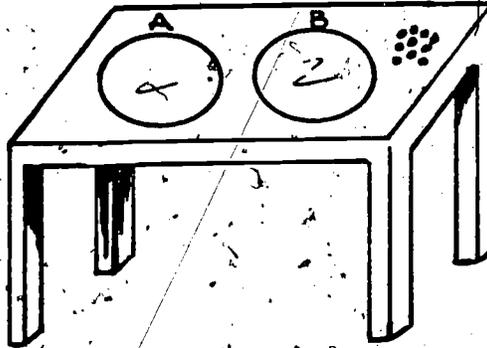
Add 4 odd numbers to get 10. (You may use a
number more than once!) How many ways can it
be done?

6

B 0 5

N	D
1	13
3	12
5	11
7	10
9	9
11	8
13	7	*

N is for nickel
D is for dime

Sum = $1.35

B 0 6

```
MOON
MONO
MNOO
NOOM
NOMO
NMOO
OMON
ONOM
OMNO
ONMO
OOMN
OONM
```

7

B 0 5   Adam has 20 coins worth $1.35. They are all nickels
         and dimes. How many of each kind of coin does Adam
         have?

B 0 6   List all the 4-letter words you can make from "MOON."
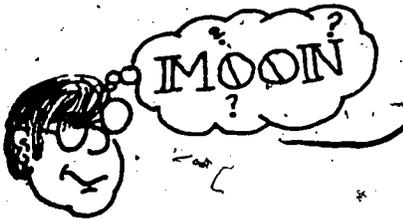
Hint: Nonsense words are okay. How many words can you make
         starting with MO? How many starting with MN? Pick
         another letter to use first.

B 0 7

| MATH	AMTH	TMAH	HMAT
MTAH	ATMH	TAMH	HAMT
MTHA	ATHM	TAHM	HATM
MAHT	AMHT	TMHA	HMTA
MHTA	AHMT	THMA	HTMA
MHAT	AHTM	THAM	HTAM

B 0 8

WNCE
WNBE
WNDCE
WDE
WDNCE
WDCE
WNCDE

9

B 0 7   How many ways can you arrange the letters of "MATH" to make new words? (nonsense words permitted)
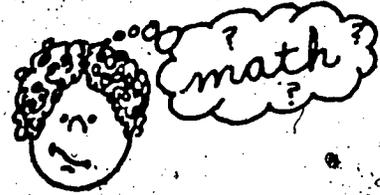
B 0 8   In preparing for a road rally, Ralph had to find different routes from Westland to Eastland. How many ways could Ralph travel from Westland to Eastland without going through the same city twice on a trip?
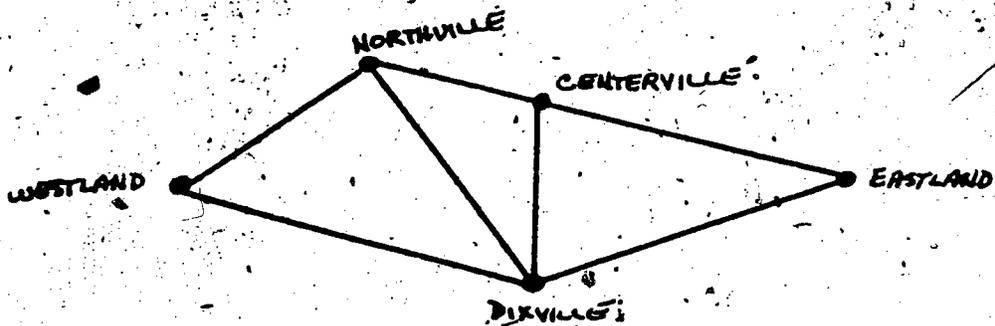
Hint: How many ways are there from Northville to Eastland? How many ways from Dixville to Eastland?

B 0 9

1st	2nd	Product	Sum
1	48	48	49
2	24	48	26
3	16	48	19
4	12	48	16
6	8	48	14	*

B 0 10

Fred	Hermie	Sum	Difference
1	14	15	13
2	13	15	11
3	12	15	9
4	11	15	7
5	10	15	5
6	9	15	3	*

11

B 0 9   I am thinking of two numbers. Their s
product is 48. What are the two numbe

Hint: What are all possible pairs whose product

B 0 10

Fred and Hermie added their ages a
difference in their ages is 3.   Ho
and Hermie?

12

B 0 11

Q	D	N	P	Number of coins
1	1	1	3	6
1	0	3	3	7
1	0	0	18	19
0	4	0	3	7
0	3	2	3	8
0	3	1	8	12
0	2	4	3	9

number of coins
value of coi

B 0 12

```
19 ----- 1 + 9 = 10
28 ----- 2 + 8 = 10
37 ----- 3 + 7 = 10
46 ----- 4 + 6 = 10
55 ----- 5 + 5 = 10
64
73
82
91
```

13

B 0 11   Bonnie has nine coins in her purse that are worth 43¢.
          What coins must she have?

B 0 12   List all the numbers between
                                                1 and 100 that have 10 as the
                                                sum of their digits.
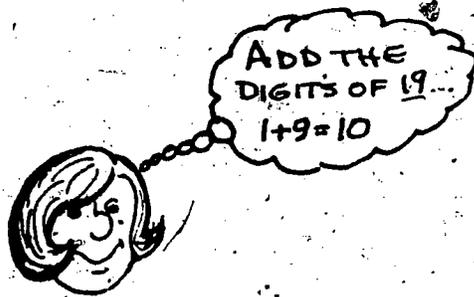
                          ADD THE
                          DIGITS OF 19...
                          1+9=10

14

B 0 13   ans. 24

P N D Q   N P D Q   D P N Q   Q P N D

P N Q D   N P Q D   D P Q N   Q P D N

P D N Q   N D P Q   D N P Q   Q N P D

P Q N D   N Q P D   D Q P N   Q D P N

P D Q N   N D Q P   D N Q P   Q N D P

P Q D N   N Q D P   D Q N P   Q D N P

B 0 14   ans. 6

15
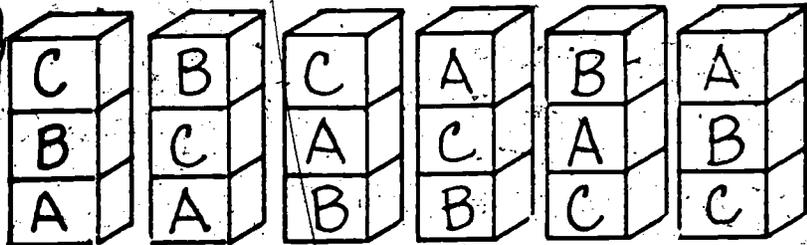
B 0 13   In how many ways can you arrange the order of a
              penny, nickel, dime, and quarter in a row?

B 0 14

              How many ways can these three blocks be stacked.
              on top of each other?
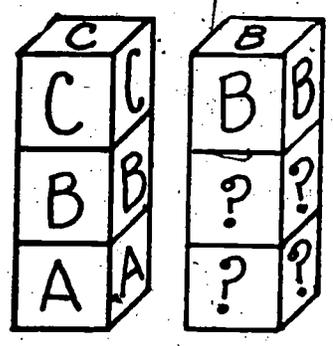
B 0 15   ans. 6
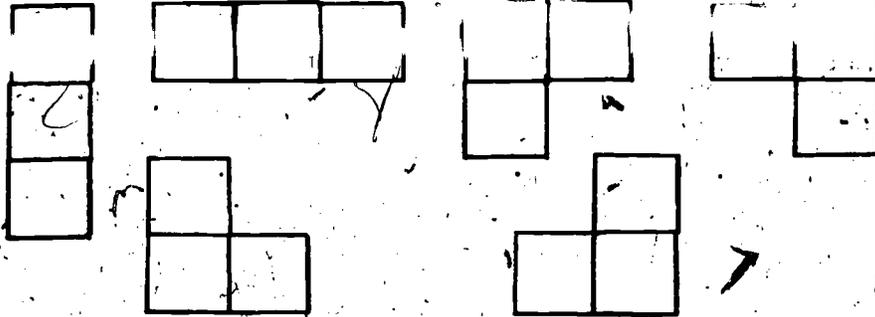
B 0 16   <u>one solution</u>   <u>another solution</u>

6 darts   6 darts

	2	6	9	number of darts
	2	6	9	1
	4	12	18	2
	6	18	27	3
Points	8	24	36	4
	10	30	45	5
	12	36		6
	14	42		7
	16	48		8
	18			9
	20			10

|	9	6	2	Total	Points left
Darts used	3	1	0	33	1
	2	2	0	30	4
	2	2	2	34	0

17

When you buy stamps at the post office, they are usually attached to each other. How many different ways can you buy three attached stamps?

(non-solution:)

B O 16

Don bet Paula that he could score a total of exactly 34 points on his dartboard. What is the least number of darts needed to score 34?
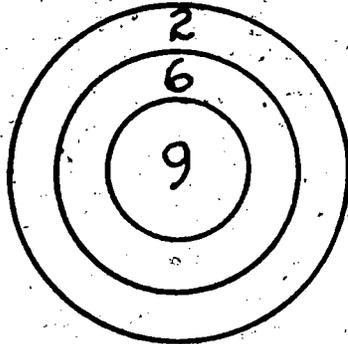
B 0 17

1 x 1 x 12   1 x 3 x 4   1 x 6 x 2   2 x 2 x 3

B 0 18   ans. 24

ABCD   BACD   CABD   DABC
ABDC   BADC   CADB   DACB
ACBD   BCAD   CBAD   DBAC
ACDB   BCDA   CBDA   DBCA
ADBC   BDAC   CDAB   DCAB
ADCB   BDCA   CDBA   DCBA

B 0 17   How many different shaped boxes can you fill
          using 12 cubes?
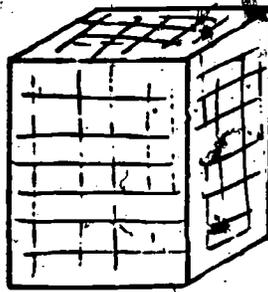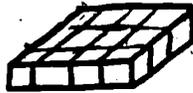

Example: one way: 12 boxes: 1 layer 4 wide
                                                     and 3 deep.

B 0 18

How many ways can 4 blocks be stacked on top of each other?
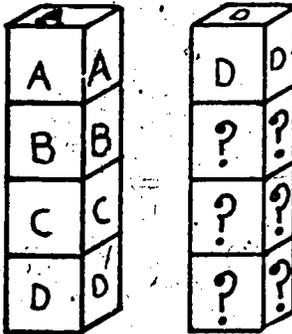
B 0 19

P	N	D
25	0	0
20	1	0
15	2	0
15	0	1
10	1	1
10	3	0
5		1
5	0	2
5	4	0
0	1	2
0	3	1
0	5	0

P is for pennies
N is for nickels
D is for dimes

B 0 20

P	N	D
25	0	0
20	1	0
15	2	0
15	0	1
10	1	1
10	3	0
5	2	1
5	0	2
5	4	0
0	1	2
0	3	1
0	5	0

P is for pennies
N is for nickels
D is for dimes

How many ways can you make change for a quarter?

B 0 20
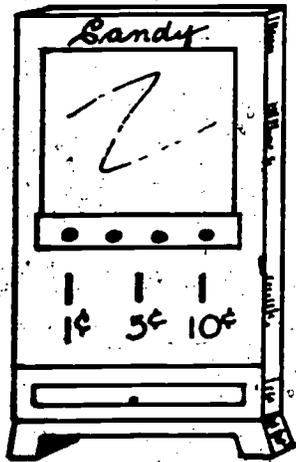
Jan wanted to buy a 25¢ candy bar.
The machine had a place for
pennies, a place for nickels, and
a place for dimes. How many ways
could she put coins into the
machine in order to pay for her
candy?

B U 2L   ans., 6

23

B 0 21

Joe was reorganizing his stamp collection. He noticed
that stamps that he had 3 of, were attached in several
different ways. As he thumbed through his collection,
he made a note of the different ways he found. How
many ways did he discover?

List the ways 10 coins can be used to make change for 59¢.

W 0 2

Place 2,3,4,5,6,7,8,9, and 10 in the squares so the sum of three numbers in any straight line direction is always 18.

Make a list:

1st number	2nd number	3rd number	Sum

P	N	D	Q	H	
9	0	0	0	1	*
4	1	0	2	0	
9	0	0	2	0	
4	0	3	1	0	
4	2	2	1	0	
9	1	2	1	0	
4	4	1	1	0	*
4	6	0	1	0	
4	1	5	0	0	*
4	3	4	0	0	

At this point it can be seen that 4 pennies will always be
needed and that the sum of nickels and dimes will always be
greater than 6.

1st num.	2nd num.	3rd num.	Product
100	10	1	1000
100	5	2	1000
50	20	1	1000
50	10	2	1000
50	5	4	1000
25	20	2	1000
25	10	4	1000
20	10	5	1000

2	100	5
25	10	4
20	1	50

W 0 3   Lester had a code. In addition exercise, each letter
                        stands for one of these numbers -- 2, 6, 7, 8

$$
\begin{array}{r}
PQ \\
PQ \\
+ PQ \\
\hline
RRS
\end{array}
$$

What number does each letter represent?

Hint: If P = 2, what are the possibilities for Q?

    If P = 6, what are the possibilities for Q?

W 0 4   Place the numerals 1 through 7 in the circles
                       so that the sum of each 3 circles in a straight
                       line is 12.
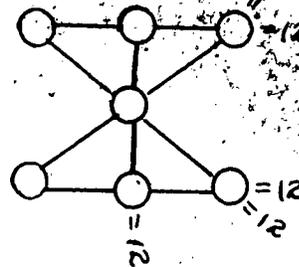
W 0 3   P = 7   Q = 6   R = 2   S = 8

R in hundreds place comes from regrouping, so it
must be 2. In regrouping either 1 or 2 is carried.
For R in tens place to be 2, a 1 must be carried
from adding Q's, forcing P = 7 and Q = 6.

W 0 4   7   1   4
               7   2   3
               6   1   5
   6   2   4
               5   3   4
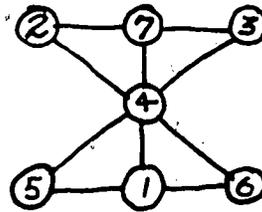
W 0.5

Sue planned for a large Chinese party. What is the least
number of guests she planned for if every 2 guests used a
dish for rice between them, every 3 used a dish of gravy
between them, and every 4 used a dish of meat between them?
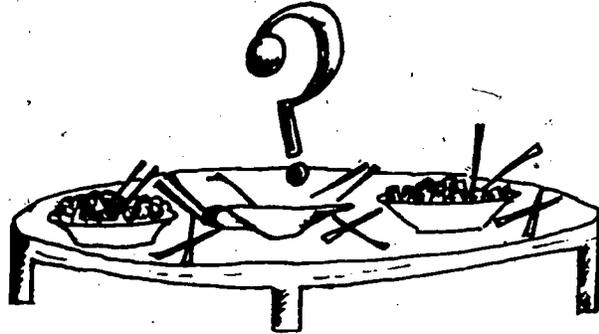
W 0 6

How many 4 digit numbers can you make using numbers
1,2,3,4 only once? (Example: 4,321)

W 0 5

RICE	GRAVY	MEAT
2	3	4
4	6	8
6	9	12
8	12	16
10	15	
12		
14		

Multiples of 2,3,4 would be needed for
each food type. Answer is LCM of 2,3,4.

W 0 6

|			
1 2 3 4	2 3 4 1	3 4 1 2	4 3 2 1
1 2 4 3	2 3 1 4	3 4 2 1	4 3 1 2
1 3 2 4	2 1 3 4	3 2 1 4	4 2 3 1
1 3 4 2	2 1 4 3	3 2 4 1	4 2 1 3
1 4 2 3	2 4 1 3	3 1 2 4	4 1 2 3
1 4 3 2	2 4 3 1	3 1 4 2	4 1 3 2

W 0 7   Replace the x's with the numbers
1 through 14 so the sum in each
circle is 21.   (3,6,7,10,12, have
already been put in place.)
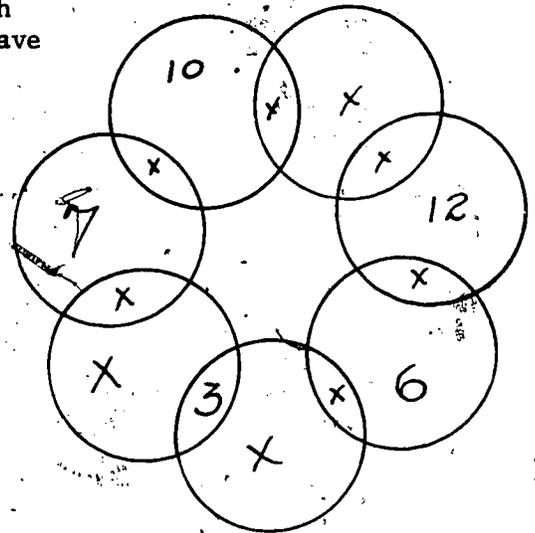
W 0 8   Ralph, the computer, woke up one morning with a
headache.   He had been trying to figure out this
problem.   Can you help him?

I am thinking of two numbers whose sum is 35 and
their product is 250.   What are the numbers?

31
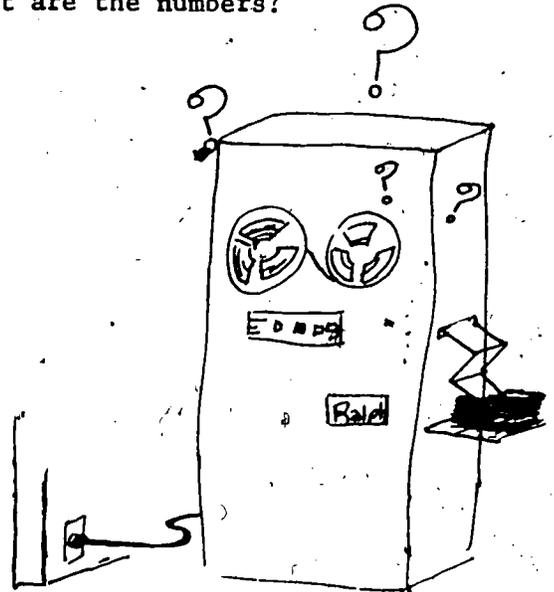
W O 7

Begin list using numbers that are found in circles next to each other such as circles A and B.
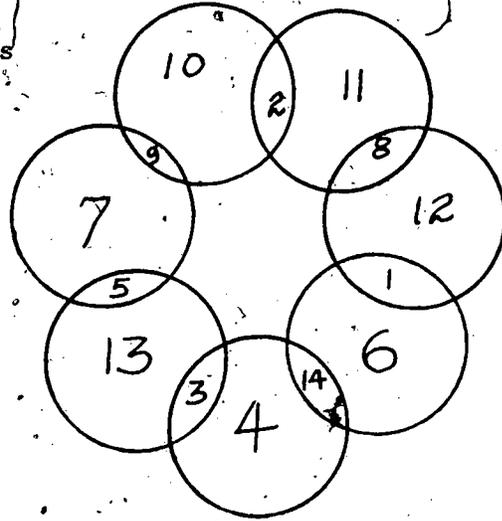

```
10    2    9  *
10---3---8
10---4---7
10---5---6
-7---1---3
-7---2--12          6   1   14  *
-7---3--11          6   2   13
  7   5   9  *      6---3---12
-7---6---8          6   4   11
 12   1   8  *      6---5---10
12---2---7         14---2----5
12---3---6         14---3----4
 12   4   5
```

Eliminate triples where placed numbers are not in same circle.

W O 8

1st	2nd	Prod	Sum
1	250	250	251
2	125		127
5	50		55
10	25	250	35	*

W O 9   If Mr. Marra adds ten years to his present age and
         doubles it, he would be 82.   How old is Mr. Marra now?

W O 10   If Mr. Marra added 15 points to Shelly's test grade and
         multiplied the new number by four, it would equal 352.
         If 70 is passing, show by listing if Shelly passed the test.

W 0 9

Present age		add 10	double	answer 82
Guess	20	30	60	No
	21	31	62	No
Skip	30	40	80	No
	31	41	82	Yes

W 0.10	Grade	add 15	multiply by 4	answer 352
Guess	60	75	300	No
	65	80	320	No
	70	85	340	No
	71	86	344	No
	72	87	348	No
	73	88	352	Yes

She passed because her grade was 73.

34

W 0 11

Mrs. Taylor tried to hide the amount of money
she spent on clothes. She told Mr. Taylor that
if he took the amount she spent, divided by 4,
and then subtracted $20, he would get $5.
How much did she spend?

W 0 12

Three foxes and three geese had to cross the river
on a boat, two at a time. If there were ever more
foxes than geese together, the geese would be eaten.
How could all of them get across the river?

W 0 11	Spent	Divide by 4	Subt. 20	Answer 5
	20	5	can't	no
	80	20	0	no
	100	25	5	yes *

W 0 12

G G G F F F		
	F F →	F
	← F-	
G G G F F		
	F F →	F F
	← F	
G G G F		
	G G →	G F
	← G F	
G G F F		
	G G →	G G G
	← F	
F F F		
	F F →	G G G F
	← F	
F F		
	F F →	G G G F F F

36

W 0 13   Place the numbers 1 through 9 in the cells
          so the sum in each direction is 15.
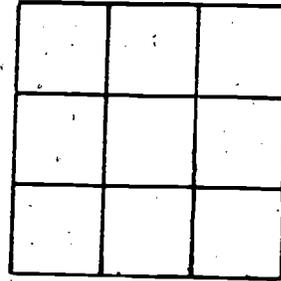
W 0 14

For a school project Boy Scouts and Girl Scouts bought 3 Maple Trees
and 3 Apple Trees to line the sidewalk from the parking lot to the
school building. They wanted an equal number of trees on each side
of the sidewalk. How many different ways can the trees be arranged
along the sidewalk?

Example:
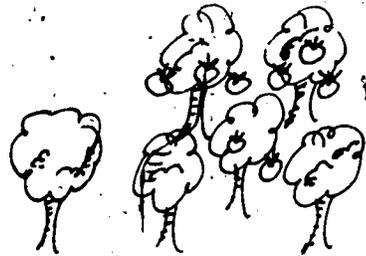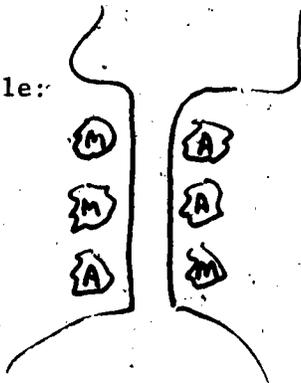
5 is used most often in list
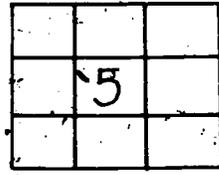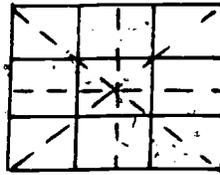
1 + 9 + 5
1 + 8 + 6
2 + 9 + 4
2 + 8 + 5
2 + 7 + 6
3 + 8 + 4
3 + 7 + 5
4 + 6 + 5

The corners are used 3 times: 6,8,4,2

6		8
	5	
2		4
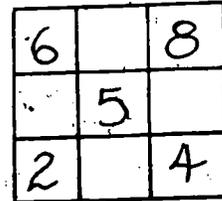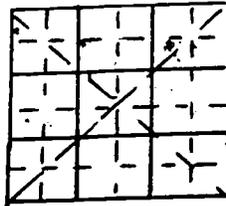
Complete Solution:

6	1	8

W 0 14

M‖A		A‖M		A‖M		A‖M		A‖M
M‖A		M‖A		A‖M		A‖M		M‖A
M‖A		M‖A		M‖A		A‖M		A‖M

M‖A		M‖A		M‖A
A‖M		A‖M		M‖A
M‖A		A‖M		A‖M

38

W 0 15   How many different 5-legged trips can an
           ant make in crawling from A to B?
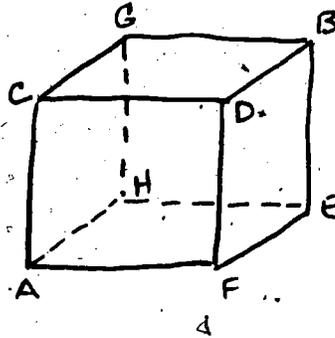
W 0 16   The license plate on Vicki's Vega has three
           digits. Their product is 216 and their sum
           is 19. What are the three digits?

W O 15

```
A C G H E B
A C D F E B
A F D C G B
A F E H G B
A H G C D B
A H E F D B
```

W O 16

1st	2nd	3rd	Product	Sum
3	9	8	216	20
6	6	6	216	18
6	4	9	216	19

40

G 0 1

H	Q	D	N	P	
1	1	4	0	0	= 1.15 *
1	1	3	1	0	= 1.10
1	1	2	1	0	= 1.00

The rules say the man cannot make change for a dollar, so 2 half dollars cannot be used.

Also, he cannot have pennies because 5 would be needed but it would change a nickel.

G 0 2   ans. 12 ways

1	3	5	7	9	11	13	15	17	19
7						1			
6	1				1				
6		1		1					
6			2						
5	2			1					
5	1	1	1						
5	0	3							
4	3		1						
4	2	2							
3	4	1							
2	1	3							
2	6								

G 0 1

A man has $1.15 made up of 6 American coins. He
cannot make change for a dollar, a half dollar,
a quarter, a dime, or a nickel. Which 6 coins does
he have?

G 0 2

How many ways can you add 8 odd numbers to get 20?
(You may use a number more than once!)

G 0 3

901	505	307	253	19
910	550	370	235	91
802	541	361	244	82
820	514	316	109	28
811	523	352	190	73
703	532	325	181	37
730	406	343	118	64
721	460	334	172	46
712	451	208	127	55
604	415	280	163	
640	442	271	136	
631	424	217	154	
613	433	262	145	
622		226		

G 0 4

6	3	1
5	0	3
5	1	0
4	3	2
4	0	3
3	3	4
3	0	5
2	0	7
1	0	9
0	0	11

or

6	3	1
5	0	3
5	1	0
4	2	3
3	4	3
3	5	0
2	7	0
1	9	0
0	11	0

43

G 0 3   You are a contestant waiting backstage to appear on a new
         game show. You know the stage will be filled with prizes
         with price tags from $1.00 to $1,000. You will be allowed
         to keep each prize with a price tag whose digits add up to
         10. You will be given one minute to find the prizes, so
         you decide to make a list. How many prizes will you take
         home? What will be the least expensive prize? What will
         be the most expensive prize?

G 0 4   During a recent football game your team scored 33 points.
         What are the different ways these 33 points could have
         been made?

                        Touchdown - 6
                        Point after - 1
                        Field goal - 3

44

G 0 5

By 2's	By 3's	By 5's
3	4	6
5	7	11
7	10	16
9	13	21
11	16	26
13	19	31
15	22	36
17	25	
19	28	
21	31	
23	34	
25		
27		
29		
31		
33		

The list consists of the <u>multiples + 1</u> of each number.

A shorter solution, not requiring a list, is one more than the LCM of the three numbers. (2·3·5 + 1)

G 0 6

Sum = 20

9	8	2	1
9	7	3	1
9	6	4	1	*
9	6	3	2
9	5	4	2
8	7	4	1
8	7	3	2
8	6	5	1
8	6	4	2
7	6	5	2	*
7	6	4	3	*
5	4	8	3	*
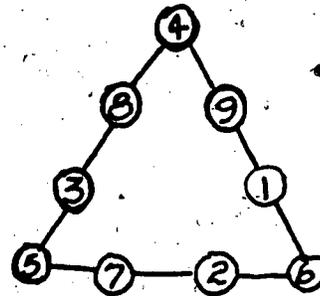
This is one solution. Each vertex number is used twice. After the list is made, find 3 numbers that appear in two sets. (Two numbers should not appear in the same two sets, such as 9 and 9 in 9641, 9632.) These will be the vertex numbers, and the remaining will fit into place easily.

G 0 5
A packing expert trains his packing crew on the
following problem. Could you make it on his crew?

Place marbles in the box by 2's, then 3's, then 5's.
Each time there is one marble left over.

What is the smallest number of marbles possible to
be able to do this?

Hint: List the different amounts of marbles if they are put in
the box by 2's and 1 is left over: 3, 5, ...
Do the same for 3's.

G 0 6

Place the numerals 1 through 9 in
circles so the sum of each side is
20.
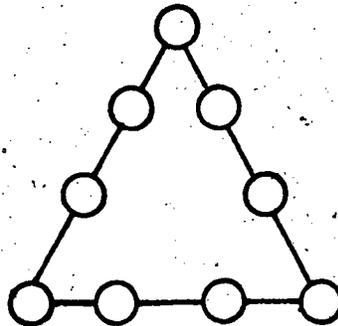
46

G 0 7

9	5	2	1	* sum = 17
9	4	3	1	1
8	6	2	1	1
8	5	3	1	1
8	4	3	1	2	*
7	6	3	1	1	*
7	5	4	1	2
7	5	3	2	2
6	5	4	2	2

G 0 8

9	8	5	1	* sum = 23
9	8	4	2	
9	7	6	1	2
9	7	5	2	3
9	7	4	3	*
9	6	7	1	3
9	6	6	3	2
8	7	6	2	3	*
8	7	5	3	4
8	6	5	4	

47
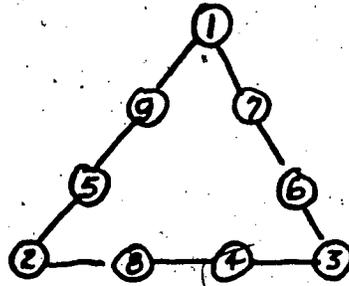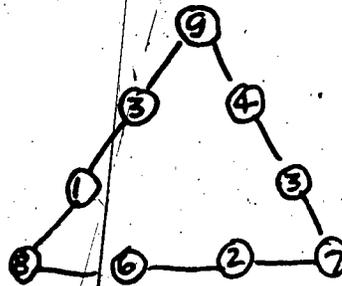
G 0 7 Place the numerals 1 through 9 in the circles
so the sum of each side is 17.
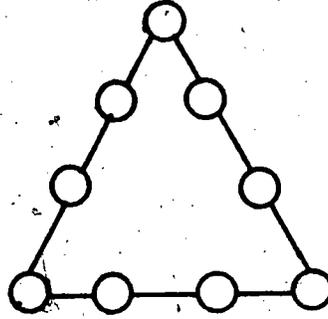
G 0 8 Place the numerals 1 through 9 in the circles
so the sum of each side is 23.
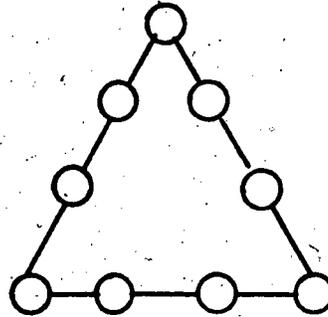
|		
H H H H C C		
H H H H	C C→	C C
H H H H C	←C	C
H H H C	H→	H C
H H H C C	←C	H
H H H	C C→	H C C
H H H C	←C	H C
H H C	H→	H H C
H H C C	←C	H H
H H	C C→	H H C C
H H C	←C	H H C
H C	H→	H H H C
H C C	←C	H H H
H	C C→	H H H C C
H C	←C	H H H C
C	H→	H H H H C
C C	←C	H H H H

G O 10

L	W	H
1	1	24
1	2	12
1	3	8
1	4	6
2	2	6
2	3	4

49

G 0 9

Four hikers came to a wide river. The only way they could cross
the river was in a small boat owned by two children. The boat
would hold both children or one hiker. It would not hold a hiker
and a child and it would not hold two hikers. How did the hikers
cross the river using only one boat?
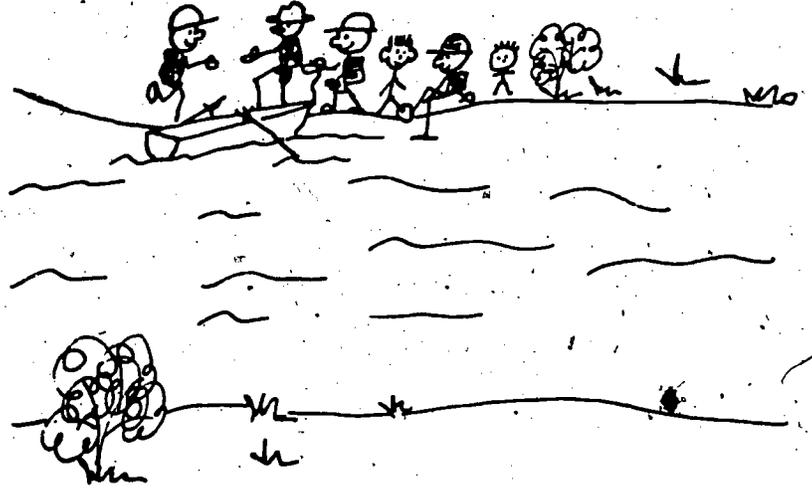
G 0 10

How many different ways can you make a right
prism (rectangular solid) from 24 cubes?
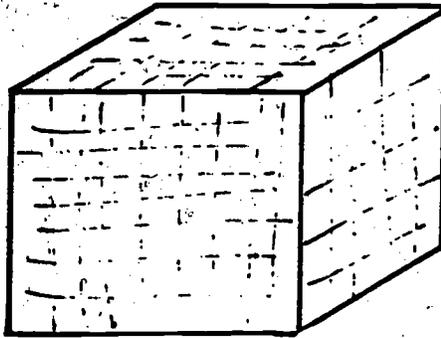
Each of the letters in this example stands for a
numeral. If the letters in the words SEND and
MORE were added and the result was the sum MONEY,
what numeral does each letter represent? Remember,
a letter always stands for the same numeral.

```
  SEND
+ MORE
 MONEY
```

G 0 12

Mr. Jones was taking the yearly census. He was told that 3
people live in the red brick house at the end of the street.
He found out that the product of their ages was 1296, and the
sum of their ages was 40. None of the members of the house-
hold was older than Mr. Jones, and he was 21. Complete the
census by writing the ages of each person.

G O 11

```
 SEND          9567
+ MORE       + 1085
 MONEY        10652
```

G O 12

Try numbers 21 or less that will divide
1296 evenly.

1st	2nd	3rd	Sum
18	72	1	91
18	36	2	56
18	24	3	45
18	18	4	40

*

G 0 13   Three boys sit in a row, one behind the other.

TOM   DICK   HARRY
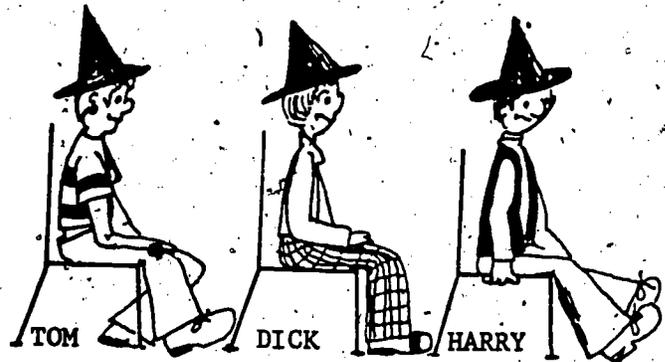
Sue has 5 hats (3 red, 2 green). While the boys had their eyes
closed, Sue placed hats on their heads and hid the rest. After
opening their eyes, neither Dick nor Tom could tell which color
their hat was. Then Harry said his was red. How could he tell?
(Hint: List the possible colors of hats that each could have on
their heads. Then ask yourself: What can Tom see? What can
Dick see?

G 0 14

Before recess three boys counted their marbles. Each boy
found his count to be a prime number. The sum of the
numbers was 101.

At recess each boy won 6 marbles. Each still had a count
that was a prime number. Two boys found their sum to be
100.

How many marbles did each boy have at the start?

G 0 13

Tom	Dick	Harry
R	R	R
R		R G
R	R G	R
G	R	R
R	6	6
G	R	G
G	G	R

Tom could not
This means Di
did not have
those elimina

Dick could n
This means Ha
green. If Ha
Tom's remark
and Harry did
would have to
red. So, Ha
red. (Dick
marked Y.)

G 0 14

__Solutions__

47, 41, 13
     and
83, 13, 5

(1) Primes	(2) Prime + 6 = Prime	Sum from column (2) = 100
2		
3		
5	11	
7	13	
11	17	
13	19	
17	23	
19		
23	29	
29		
31	37	
37	43	
41	47	
43		
47	53	53 + 47
53	59	
59		
61	67	
67		
71		
73	79	
79		
83	89	89 + 11
89		
97	103	
101		54

G 0 15   There are teams of one boy and one girl each for the
            school olympics. So far, 53 students have signed up.
            When the number of boys is multiplied by the number of
            girls, you get 700. If there are more boys than girls,
            how many teams can you make? How many more girls need
            to sign up if every boy is to have a partner?

G 0 16   If one person rolls two dice, many pairs of numbers are
            possible to add to get the sum of the two dice. Which
            of the following is most likely?

            A.   the sum of the dice is 7

            B.   "   "   "   "   "   " 5

            C.   "   "   "   "   "   " 9

G 0 15

Girls	Boys	B x G	Sum
1	700	700	701
2	350	.	352
4	175	.	179
5	140	.	145
7	100	.	107
10	70	.	80
14	50	.	64
20	35	.	55
25	28	700	33

*

25 girls, 28 boys.
There are 25 teams;
3 more girls are needed.

G 0 16

| 2nd DIE						
6	7	8	9	10	11	12
5	6	7	8	9	10	11
4	5	6	7	8	9	10
3	4	5	6	7	8	9
2	3	4	5	6	7	8
1	2	3	4	5	6	7
	1	2	3	4	5	6

1st DIE

Table of sums for two dice.

There are 36 possible sums.

Possibilities for 7 is 6
5 is 4
9 is 4

7 is the most likely sum.

56

Don bet Paula that he could
score a total of exactly one
hundred before she could on
the dart board. What is the
least number of darts Don
needs to reach his goal?

16
17
23
24
39
40
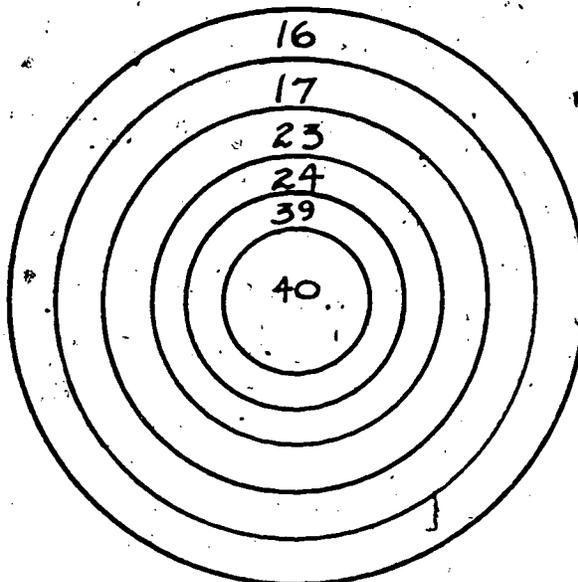
G 0 18

John was taking archery. One day he shot
6 arrows. Each hit the scoring area of
the target. Which of the following num-
bers could have been his score: 17, 28,
5, 56, 35.

Hint: What is the smallest
score John could get?

What is the largest possible
score?

1
3
5
7
9

G O 17
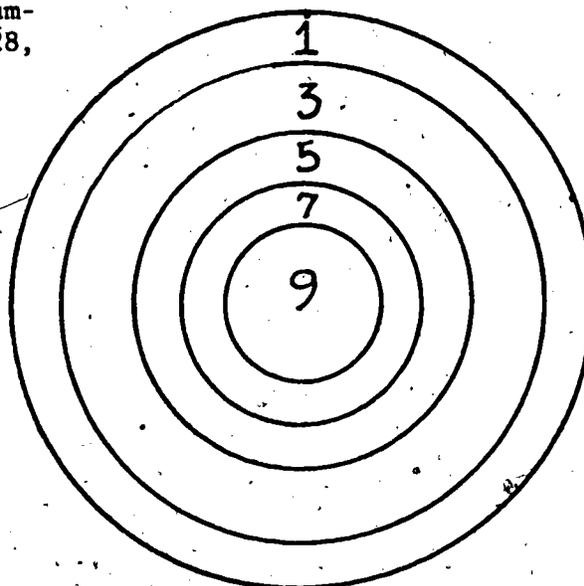
Target Scores

	.16	17	23		39	40
	16	17	2	39	.40
	32	34	6	78	80
	48	51	69	117	120
	64	68	92		
	80	85	115		
	96	102			

(sums of darts)

ans. 6 darts

4 in 17, 2 in 16

G O 18

1	3	5	7	9
1	3	5	7	9
2	6	10	14	18
3	9	15	21	27
4	12	20	28	36
5	15	25	35	45
6	18	30	42	54

Score

17 : No
28 : 1 in 3, 5 in 5
 5 : No
56 : No
35 : No

58

G 0 19

        IS   I = 4   Since S + S is the same as S + I,
      + SS   S = 5   1 must be carried from the one's
      ─────   T = 1   column to the ten's column.
       TEE   E = 0

The only value S could be to require regrouping is 5.   S + S = E
                                                          5 + 5 = 10

Then I must be 4   I + S + Carry = E
                      4 + 5 + 1 = 10

        45
      + 55
      ─────
       100

G 0 20

| Safety | Field Goal | Touchdown | Point after |
S	F	T	P
15	3	0	0
13	0	1	1
12	3	0	1
12	1	1	0
10	0	2	1
10	2	2	1
9	1	2	0
9	3	1	0
9	5	0	0
8	1	2	2

7	0	3	1	4	6	1	1	1	1	4	4
7	2	2	1	3	1	4	0	1	4	3	1
7	4	1	1	3	0	4	3	1	6	2	1
6	0	3	0	3	3	3	0	1	8	1	1
6	1	3	0	3	2	3	0	0	0	5	0
6	3	2	0	3	5	2	0	0	3	4	3
6	5	1	0	3	7	1	0	0	5	4	0
5	7	0	2	3	9	0	2	0	4	3	3
5	1	3	2	2	1	4	2	0	7	2	0
5	3	2	2	2	3	3	2	0	9	1	0
4	0	4	1	2	5	2	1	0	11	0	0
4	2	3	1	1	0	5	1				
4	4	2	1	1	2	4	1				

G O 19

Sue had a code where letters were used for numbers. Each
letter in the addition exercise stands for one of these
numbers -- 0, 1, 4, 5

```
   IS
+ SS
  TEE
```
What number does each letter represent?


G O 20

Out flag football team scored 33 points. How many different
ways could 33 points be scored if:

    a. a touchdown is worth 6 points

    b. the point after is worth 1 point

    c. a field goal is worth 3 points

    d. a safety is worth 2 points


Remember that a point after can only be scored after a
touchdown. List the point combinations in each possibility.

G O 21

Behind John and Karen's house are two mini-bike tracks. It takes John 12 seconds to complete each lap. Karen completes a lap every 15 seconds. If they both start at point R at the same time, how many seconds will it be before they meet at Point R?
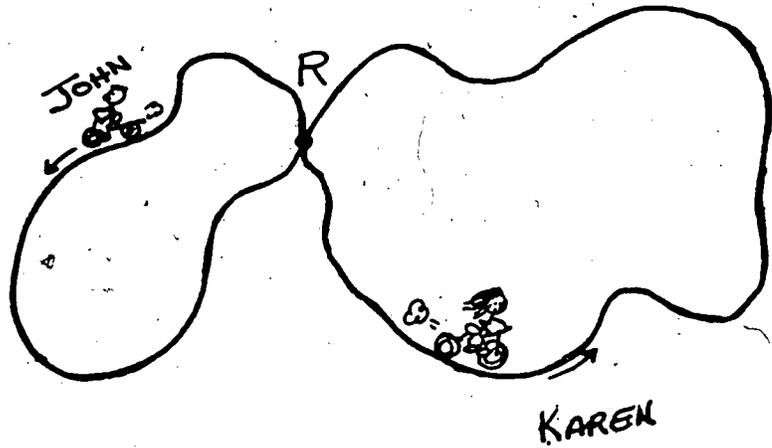
G O 21

| Laps | Minutes to reach R | |
| | John | Karen |
| --- | --- | --- |
| 1 | 12 | 15 |
| 2 | 24 | 30 |
| 3 | 36 | 45 |
| 4 | 48 | 60 |
| 5 | 60 | |

They will meet in 60 seconds.