Puzzle ID : INPC2005-01 77 figure dissection

Cut two sevens into numbers of pieces. Put together them, then, make a regular triangle and a square which are just same area as a seven both. Numbers of pieces is minimum best.



Answer Key: Number of Pieces altogether. Show the cutting figure on two 7s and show a triangle and a square with cutting lines.

Puzzle ID : INPC2005-02

pup zuz puzzle

Find the longest character string only consisting of "p", "u", and "z", such that it does not include an iterative substring, and also includes neither "puz" nor "zup" as substring. For example, "pzz" is not the case because it repeats "z", and "zpuzpz" is not good too because it has "puz". Such a string as "zpupzu" is good, but find the longest.

Answer Key: Write the longest character string. Enjoy careful thinking!

AYDA

AYDA name must be read in every column; either upward or downward, and also must be read in every row; either left to right or right to left. Arrows indicating that AYDA name must be written in that direction, x is indicating that; cell is empty.



Answer Key: Write the letters in the 6x6 square row by row, using x at blank cells.

Puzzle ID : INPC2005-04 Best set for maximum of differences

Choose an integer n with n>=2. Select a set of n different integers between 1 and (n*n-n+2)/2. You can choose if you wish 1 and/or (n*n-n+2)/2 in the set. Then form, for each couple of numbers among the set, the absolute difference of the two numbers of the couple, and count the number of different differences you obtain. Let's call it d. Your job is to maximize M= n*n/(n*n-2*d). For example if I choose n=6 and the set (1,2,3,5,10,16), then I get for the differences : 1,2,3,4,5,6,7,8,9,11,13,14 and 15, that is 13 different numbers. So d=13 and M=36/36-26=3,6

Answer Key: For your answer, give the value of n and the choosen set of n numbers. For the example, the answer key is : 6;(1,2,3,5,10,16)

Closer!

Consider the standard letters from the Latin alphabet and attach one number to each letter. Define the starting letter as "A" and give the number "1", then set a length of distance which will be used to get to the next letter that will take the number "2" and so on until "26". If a reached letter is already numbered, find the first unnumbered letter. Using this numbers for the letters make the sum of numbers in the sentence "Noble Puzzle Contest". This sum must be as close as possible to a perfect square number (like 4, 9, 16, 25 etc.). Note the difference between your sum and the closest perfect square number with PS1. Then make the sum of the others 15 letters from the alphabet (that are not used in sentence "Noble Puzzle Contest"). This sum must be also as close as possible to a perfect square number with PS1. Then make the difference between this sum and the closest perfect square number with PS1. Then make the difference between this sum and the closest perfect square number with PS1. Then make the difference between this sum and the closest perfect square number with PS1. Then make the difference between this sum and the closest perfect square number with PS2. Find the minimum of PS1+PS2.

Standard Latin alphabet:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z .

Answer Key: write first your minimum PS1+PS2, then the letters with corresponding numbers in alphabetical order (as A-1, B-2, C-3 . . .).

Puzzle ID : INPC2005-06

Fill the Box

Fill the box with letter cards so that each word of the pangram below can be read either across or down in any one of the four directions. Some cards are already placed.



Answer Key: Write the letters you put on the second column, in order from top to bottom, as in - - - B -.

Puzzle ID : INPC2005-07 Everywhere 150yen!!!

Divide it into four "congruous" parts, so that each part includes 150yen.

Here are two attentions:

First, you have to divide it along the dotted line.

The second attention is about the meaning of "congruous". In this problem , when the figure A coincides with the figure B only by rotating it , (without flipping it ,) we say that the figure A and the figure B are "congruous". Best of Luck!!!



Everywhere 150yen!!!

Answer Key: Please look at the right picture. When you have solved this problem , write the numbers included in each part. For example: (1,2,3,4,9,10,11,12,17,18,19,20,25,26,27,28) and(5,6,7,8,13,14,15,16,21, 22,23,24,29,30,31,32) and(33,34,35,36,41,42,43,44,49,50,51,52,57,58,59,60) and(37,38,39,40,45,46, 47,48,53,54,55,56,61,62,63,64)

Puzzle ID : INPC2005-08

How many coins are they in the NOBle prize, just?

Please guess how many coins in the NOBle Prize.

URL; http://www.npb.go.jp/ja/banknote/intro.html

http://www.mint.go.jp/operations/page01.html

Top secret? http://madeira.cc.hokudai.ac.jp/RD/artifex/500YenCoin/index.ja.html

Answer Key: I guess ? coins just. A breakdown is as follows,

500 Yen= 100 Yen= 50 Yen= 10 Yen= 5 Yen= 1 Yen=

Puzzle ID : INPC2005-09 PAGODA

The puzzle is a 3-piece burr. You must assemble it (put it together) so that it forms a symmetrical solid shape.

3-piece burr

The idea behind the design of this puzzle was that the three pieces should be as similar to each other as possible. In the diagrams above a figure one indicates that there is an additional cube above the basic shape. Minus 1 indicates that there is a cube underneath the basic shape. 0 indicates that there is an additional cube both above and below the basic peice. There is one internal void whitch could have been avoided (excuse the pun) but this would have meant that the three pieces were not as similer as I would have wished so that is my reason for this.



Answer Key: Please show how to assemble three pieces to PAGODA.

PL-W

Putting together with two planar P-hexacubes and two planar L-tetracubes. Make three kinds of W-shaped objects.



Answer Key: Show three kinds of W-shaped objects.

Puzzle ID : INPC2005-11

Six Stones

Draw a path, consisting of horizontal and vertical sections only, through any 30 numbers. The path may start and finish anywhere, but must not cross itself. No number may be used more than once. Drop 6 stones anywhere on the path. These six numbers do not count. Your aim is to maximise your score. Label the path without stones P1, P2, P3 ... P24. Your score is P1 - P2 + P3 - P4 + P5 - P6 + ... + P23 - P24.

	А	в	С	D	Е	F	G	Н	Ι	J	к	L	М	N	Ο	Ρ
а	23	34	48	41	21	49	32	12	34	43	32	43	49	21	43	12
Ь	43	31	12	17	28	47	34	32	18	36	39	49	20	50	34	41
c	14	44	32	39	28	23	23	29	31	44	45	41	31	21	32	44
d	22	22	45	12	17	35	39	31	11	33	36	42	49	31	20	11
e	34	41	12	44	44	36	38	49	33	31	11	35	11	23	43	23
f	28	34	39	21	47	31	21	12	28	19	17	44	32	21	28	45
g	11	23	45	31	34	32	30	22	11	43	44	47	24	24	34	21
h	48	13	13	16	18	32	40	50	41	23	23	20	34	31	26	23
()	43	23	23	29	45	41	23	32	31	10	29	50	43	32	33	11
	23	36	29	44	33	22	26	21	23	34	12	33	23	11	23	43
k	12	14	27	36	27	34	19	31	29	39	28	26	34	44	22	18
	22	48	42	41	23	21	45	29	28	18	17	45	13	17	19	25
m	28	44	21	33	37	38	12	16	19	23	33	41	40	17	16	23
n	25	34	38	42	41	33	22	11	16	26	36	46	44	22	22	50
0	45	41	22	25	50	21	14	25	23	43	41	22	29	28	44	43
Р	31	37	31	13	36	48	42	44	21	11	44	22	26	31	37	12

Answer Key: put your score, then the coordinate of the beginning of your path (e.g. dH), followed by each new column or row you enter. Put an asterisk (*) immediately following any stone. So your answer may look like 128: dHIJKef*JI*ghiHGF*Eh

Polygon 12

Suppose there is a circular string of which length is 12. Ignoring its thickness, make a convex polygon that satisfies

a) its area is exactly an integer n (n = 1, 2, ..., 11), and

b) all the vertices are on grid points.

Let "scale" of a polygon be defined as the ratio of unit length (one 12th of the string) to the unit interval of the grid mesh on which it can be drawn. The idea is to find a polygon with a scale as small as possible for each n, because that would have the simplest shape. Multiply the scales for n=1 through 11 to obtain the final product, which is the summary measure of your performance.

If there are different answers of the same scale, the following criteria will be applied in a lexicographic order.

(1) The fewer the number of the vertices, the better.

(2) The more symmetric the shape is, the better.

(3) The more diversified the shapes are across different n, the better.

Answer Key: Each polygon can be shown by standard x-y coordinates of vertices, as A(0, 0), B(1, 3) and so on. The scales of polygons and the total product can be shown in numbers.

Puzzle ID : INPC2005-13

Quad-Block

Fold up shapes, then assemble them into a compact block.

Quad-Block

Figuare is next 2 pages

Answer Key: To assemble the block, place identicle pieces together to form a square. Repeat with other pair. Invert one pair and place on top of other pair. (note that the pieces will also match in a way that does not allow them to make the final block)

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Quad-Block a

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