Instructions booklet
for
Puzzle Ramayan 2020 Finals
&
Indian Puzzle Championship 2020

20th December 2020
(This event will be held online)

Online Finals: **Starts at 9:00 AM**	**Round 1 – Familiar Foes**	
	Round 2 – Deja Vu	
	Round 3 – Think Different	
	Round 4 – Smart Casuals	
	Round 5 – Good Neighbours	

About this document:
These are the instructions for the 2020 Puzzle Ramayan + Indian Puzzle Championship Finals, organised by Logic Masters India. Any questions related to these instructions should be raised and discussed at

http://logicmastersindia.com/forum/forums/thread-view.asp?tid=2721

Schedule on 20th December 2020

<This will be updated in the Version 2 of Instruction Booklet>

"Official" Round timings

<This will be updated in the Version 2 of Instruction Booklet>

If a participant starts a round outside the above window, their results for those rounds shall be considered "unofficial".

Authors & Test-Solvers:
LMI thanks the authors and test solvers for their contributions to IPC 2020:

- Cedomir Milanovic (Serbia) – Author
- Craig Kasper (Canada) – Author
- Ivan Koswara (Indonesia) - Author
- Nikola Zivanovic (Serbia) – Author + Test-Solving
- Priyam Bhushan (India) – Author
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- Bram De Laat (The Netherlands) – Test-Solving
- Branko Ceranic (Serbia) – Test-Solving
- Deyan Razsadov (Bulgaria) – Test-Solving
- Ken Endo (Japan) – Test-Solving
- Wang Weifan (China) – Test-Solving
- Yanzhe Qiu (China) – Test-Solving
- Yuhei Kusui (Japan) – Test-Solving

General Structure of the finals

There will be 5 rounds in the finals, of varying lengths and of varying points. Scores from each round, along with bonus if any, will be added up to the base points to determine the final score of the player. This score will be used for ranking in Indian Puzzle Championship 2020.

There will be a separate ranking after these rounds, based on PR eligibility, to determine the Puzzle Ramayan winner.

How to participate?

- Download the password protected Puzzle booklet for each round. The Puzzle booklets contain the actual puzzles to be solved. It is password protected.
- You must participate in the contest during the "official" round timings on 20th December to be included in the official rankings.
- For each round, Click on "Start" button. At this time, password for pdf will be shown and timer will start.
- You can print the pdf and solve on paper. There shall be no online solving interface.
- **Each Puzzle will have an answer key. You need to enter the answer key details and click on submit button.**
- **If participants face any technical difficulty during submissions, they can email screenshots of answer keys for solved grids to logicmasteradmin@gmail.com before their timer ends.**

Scoring

Points typically indicate difficulty of the puzzles and the time required to solve them. While the organizers have made best efforts to match them, your personal experience and preference may differ.

This test uses instant grading where a solver can submit any individual puzzle and receive confirmation that the solution is correct or not. Each incorrect submission reduces the puzzle's potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively.

Bonus

It is possible that some players may finish all puzzles in a round before the time allocated. A bonus of **10 points** for each full minute remaining will be awarded to any competitor who correctly solves every puzzle in a round.

Tie Breaker

Ties will be broken using following rules:

i) Maximum points in Round 3 (including bonus points in Round 3)
ii) Maximum points in Round 2 (including bonus points in Round 2)
iii) Maximum points in Round 5 (including bonus points in Round 5)
iv) Maximum points in Round 1 (including bonus points in Round 1)
v) Maximum points in Round 4 (including bonus points in Round 4)
vi) Higher base point

PR Rules:

The top "inexperienced" players will be ranked according to their scores, to determine the Puzzle Ramayan Winner. Ties will be broken using the above tie breaker rules.

Practice Materials

The online rounds of Puzzle Ramayan will serve as great practice materials for the finals. You can access the puzzles at http://logicmastersindia.com/lmitests/downloads.asp?testFilter=PR

Prohibited Materials

Any kind of external help from other persons, mobile, solvers, computers, etc is not allowed. If the organisers feel any kind of unfair means has been used, they can review/discard individual submissions.

Puzzle rules

The remaining pages in this booklet explain the rules of the types that will appear in the finals. **Examples have been provided for Round 4 and Round 5. The examples for Rounds 1-3 shall be included in the next version of the IB.**

Answer Key

<Details of answer keys for each puzzle shall be included in the version 2 of Instruction Booklet>

Example Credits

- Arithmetic Square, Letter Pairs, Tom Tom - WPF Puzzle GP 2020 - Round 2 (India) – http://gp.worldpuzzle.org

PR Eligibility and Base Points:

This year the competition is open to all.

Below is the tentative list of players who took part in the online episodes of Puzzle Ramayan 2020 and their base points, and eligibility for PR.

NAME	ID	BASE POINTS	PR ELIGIBILITY
Prasanna Seshadri	prasanna16391	139	NO
Rohan Rao	Vopani	123	NO
Ashish Kumar	ashaash11ash	113	NO
Amit Sowani	amitsowani	103	NO
Kishore Kumar	kishy72	96	NO
Pranav Kamesh S	pranavmanu	92	NO
Jaipal Reddy Mogiligundla	mjaipal	84	NO
Rajesh Kumar	rajeshk	79	NO
Priyam Bhushan	priyambhushan	77	YES
Swaroop Guggilam	swaroop2011	74	NO
Harmeet Singh	harmeet	60	NO
Lenson Andrade	lenson	53	YES
Gaurav Kumar Jain	gaurav.kjain	52	YES
Devarajan D	devarajand	49	YES
Anubhav	ABcDexter	47	YES
Avinash	avinash175	46	YES
Sonu Sharma	SN Sam	42	YES
Vishal	Vishal	38	YES
Sravani Sripada	scampy	37	YES
Anurag	anurag	31	YES
R K Swarnakar	RameshLMI	30	YES
Swagatam Islam Sarkar	Swagatam	30	YES
Rajib	rajibrborah	25	NO
Arunesh Varade	KyaFarkPadtaHai	22	YES
Anithra P Janakiraman	anithra	22	YES
Daniel Victor	DanAvi	22	YES
Gayatri Phadnis	GAYATRIP20	22	YES
Kartik Reddy	mkartik	21	YES
Deepak Kumar	dipkmr	20	YES
Jash Panchmatiya	Jash	20	YES
Vivek Jain	vjain9	19	YES
Anil Khosla	khuski	18	YES
Anuj Shetty	anuj42	16	YES
Samata	sam_hegde	16	YES
Kumaresan R	Kumaresan R	15	YES

NAME	ID	BASE POINTS	PR ELIGIBILITY
T. N. Venkatesh	tnv	14	YES
Harsh Poddar	hpoddar08	14	YES
Sai Karthik Burra	carburra	12	YES
Varun R	rvarun	12	YES
Aakarshan Gupta	mugiwaaraLuffy	12	YES
Apurva	apurva101	11	YES
Vijaya Rajan	vijaya_rajan	11	YES
Vishnu Nandakumaran	vishnu97	11	YES
sumedha thakur	sumedha234	11	YES
Aashimi Bhatia	aashimii	9	YES
Anuradha Ganesh	Anu G	8	YES
Afsal Salu	Sal	7	YES
Swati singh	avni	7	YES
Kshitiz Gagal	chotushang	7	YES
Aashish Ghogre	ashishghogre	7	YES
Ayush Agrawal	ayushagr	7	YES
Dhruvarajsinh Puwar	dhruvarajsinhpuwar06	7	YES
nilesh gala	nilesh22	6	YES
Amit Kumar Mallik	Amit_IITB	6	YES
Madhav Sankaranarayanan	Madmahogany	6	YES
Saloni Singla	Sally	6	YES
Anurag Mundra	anurag30mnit	6	YES
Abhishek Chaudhary	abhi265645	5	YES
Dhanush K P	dhanushkp	5	YES
Ishita K	ish4	5	YES
Ritaban Datta	Reetoo	5	YES
Priya Banthia	Priya Banthia	5	YES
Prathamesh Baheti	prathameshb	4	YES
Hamma Singh	hamham	4	YES
Dinesh K Jain	DKJ	4	YES
N. Rengaswamy	Renga	4	YES
Chirag	terekokya	4	YES
Tarush Garg	tarushgarg	3	YES
Rajavel	rpmlrv	3	YES
Debapriyo	DebLuck	3	YES
Mihir Yadav	mihiryadav	3	YES
Nityant Agarwal	Nityant	3	YES
Kelvin	Samurai#11	2	YES
Prabha Doshi	prabhadoshi	2	YES
trisha	trisha	2	YES
Falak	fal_94	2	YES

NAME	ID	BASE POINTS	PR ELIGIBILITY
P. Mohan Prashanth	mohanprashanth	2	YES
Sitanshu Sah	sitaswag	2	YES
Prathima	prathima.13	2	YES
Madhumathi Raman	mathcrazy	2	YES
Vividh Bansal	bansaviv	1	YES
Raman Malik	Raman1	1	YES
Bathri Narayanan	GBathri	1	YES
malika sikka	malikasikka	1	YES
Rohit Prabhakar	RoGeRrr	1	YES
Namrata Soni	namratasoni	1	YES

List of IPC Winners (2015-2019)

Year	1st	2nd	3rd
2019	Prasanna Seshadri	Amit Sowani	Rohan Rao
2018	Prasanna Seshadri	Rohan Rao	Amit Sowani
2017	Rohan Rao	Ashish Kumar	Rajesh Kumar
2016	Amit Sowani	Rohan Rao	Rakesh Rai
2015	Rohan Rao	Amit Sowani	Swaroop Guggilam

List of PR Winners (2016-2019)

Year	1st	2nd	3rd
2019	Pranav Kamesh	Gaurav Kumar Jain	Priyam Bhushan
2018	Pranav Kamesh	Vishal Jain	Kartik Reddy
2017	Ashish Kumar	Varun R	Lenson Andrade
2016	Ashish Kumar	Kishore Kumar	Varun R

This round contains ten puzzle types from some of the categories that appeared in online rounds of Puzzle Ramayan 2020. These puzzle types were part of the online PR rounds.

Category	Puzzle Type	Points
Object Placement	Battleships	XX points
Classics	Kakuro	XX points
Evergreens	Magnets	XX points
Shading	Nurikabe	XX points
Area Division	Pentominous	XX points
Made in India	Rassi Silai	XX points
Number Placement	Ripple Effect	XX points
Object Placement	Tents	XX points
Loops	Yajilin	XX points
Shading	Yin yang	XX points

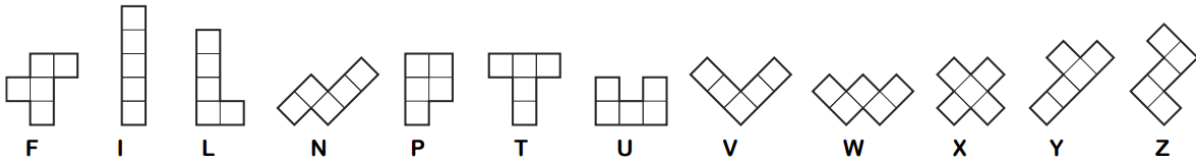
1. **Battleships (XX points)**
   Place the given fleet of ships with the shapes of the ships as shown. The numbers outside the grid indicate the number of cells occupied by ships in that row or column. Ships cannot touch each other, not even diagonally. The ships may be rotated. Some cells are known to be water and are indicated by waves.

2. **Kakuro (XX points)**
   Fill in the white cells in the grid with digits from 1 to 9. The sum of digits in each horizontal / vertical group of cells is given on its left/top. Digits do not repeat within any set of consecutive white cells.

3. **Magnets (XX points)**
   The grid is made up of magnetic and non-magnetic plates. Each magnetic plate has 2 halves: positive (+) and negative (-). Halves with the same polarity cannot touch each other vertically / horizontally. The clues outside the grid indicate the number of magnetic halves with a particular polarity in each row/column. Not all outside clues may be given.

4. **Nurikabe (XX points)**
   Shade some cells black so that the grid is divided into non-overlapping white regions. Cells are considered to be in the same region if they are adjacent horizontally or vertically. Each given number must be in a white region that has the same area in cells as that number. Each white region must have exactly one given number. All black cells must be connected with each other, but no 2×2 group of cells can be entirely shaded black.

5. **Pentominous (XX points)**
Divide the grid into pentominoes so that no two pentominoes of the same shape (including rotations/reflections) share an edge. A cell with a letter in it must be part of the pentomino shape associated with that letter. An inventory of pentominoes is given below the puzzle but all shapes may or may not be used. Shaded cells will not be part of any pentominoes. All other cells must be part of a pentomino.



6. **Rassi Silai (XX points)**
Thread a rope in each region. A rope is a path that passes through all cells of the region, between two cells that are end-points. End-points do not touch each other, even diagonally, even across regions. Some bars are given within some regions; there cannot be a path between the two cells on both sides of the bar. Numbers inside regions indicate the number of turns in that region.

7. **Ripple Effect (XX points)**
Place digits 1 to N in each thickly outlined region, where N equals the size of the region. Same digits in the same row or column must be separated by at least a number of cells equal to that digit.

8. **Tents (XX points)**
Place one tent horizontally or vertically next to each tree. Tents do not touch each other, not even diagonally. The numbers outside the grid indicate the number of tents in that row or column.

9. **Yajilin (XX points)**
Blacken some white cells and draw a closed loop passing through centres of all remaining white cells horizontally or vertically. Blackened cells cannot share an edge with each other. Some cells are outlined and in grey and cannot be part of the loop. Numbered arrows in such cells indicate the total number of blackened cells in the direction pointed at by the arrow.

10. **Yin Yang (XX points)**
Fill in the grid with white and black circles such that all white circles and all black circles form a single connected area. No 2x2 region can contain circles of the same colour.

This round contains ten puzzle types from some of the categories that appeared in online rounds of Puzzle Ramayan 2020. These puzzle types couldn't make it to the online PR rounds.

Category	Puzzle Type	Points
Shading	Tapa	XX points
Area Division	Spiral Galaxies	XX points
Shading	Cave	XX points
Loops	Masyu	XX points
Area Division	Fillomino	XX points
Loops	Maxi Loop	XX points
Object Placement	Statue Park	XX points
Area Division	Compass	XX points
Area Division	Araf	XX points
Shading	LITS	XX points

1. **Tapa (XX points)**
   Paint some cells black to create a continuous wall. Number/s in a cell indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a cell, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or larger. There are no wall segments on cells containing numbers.

2. **Spiral Galaxies (XX points)**
   Divide the grid into 180 degree symmetrical regions along the gridlines, so that each cell is part of exactly one region. Each region must contain exactly one circle, which represents the central symmetry point of the region. All circles are given.

3. **Cave (XX points)**
   Shade some cells to leave behind a single connected group — the cave — with no enclosed, shaded cells. In other words, all shaded cells must be connected by other shaded cells to an edge of the grid. All numbered cells must be a part of the cave, with each number indicating the total count of cells connected vertically and horizontally to the numbered cell including the cell itself.

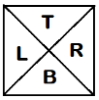
4. **Masyu (XX points)**
   Draw a single, non-intersecting loop that passes through all circled cells. The loop must go straight through the cells with white circles, with a turn in at least one of the cells immediately before/after each white circle. The loop must make a turn in all the black circles, but must go straight in both cells immediately before/after each black circle.

5. **Fillomino (XX points)**
Divide the grid along the dotted lines into polyominoes so that no two polyominoes with the same area share an edge. Each given number must represent the area of the polyomino it belongs to. A polyomino may contain zero, one, or more of the given numbers.

6. **Maxi Loop (XX points)**
Draw a closed loop through all cells by connecting the centers horizontally and vertically. The loop can't cross or touch itself. The numbers in the boldly marked area indicate the highest number of cells that the loop goes through consecutively in that area.

7. **Statue Park (XX points)**
Place each of the shapes from the given bank into the grid, with rotations and reflections allowed. Shapes must be placed exactly as many times as they appear in the bank. No two shapes can overlap or touch each other by a side, and all of the space not occupied by shapes must form a single connected area. Black circles in the grid indicate cells that must be contained in one of the shapes, and white circles represent cells that must not be contained in a shape.

8. **Compass (XX points)**
Divide the grid along the dotted lines into regions (groups of cells connected orthogonally). Each cell must be in exactly one region, and each region must contain exactly one clue.



A clue cell is of the form as shown here. The number T denotes the number of cells of that clue's region located above the clue cell. The number B denotes the number of cells of that clue's region located below the clue cell. The number R denotes the number of cells of that clue's region located to the right the clue cell. The number L denotes the number of cells of that clue's region located to the left of the clue cell. Not all clues may be given for each clue cell.

9. **Araf (XX points)**
Divide the grid into some regions containing two circles each. Each cell of the grid is part of one region. Each region must have an area that is strictly between the numbers in the circles contained in it.

10. **LITS (XX points)**
Shade exactly four connected cells in each outlined region, to form an L, I, T, or S tetromino, so that the following conditions are true: (1) All shaded cells are connected with each other; (2) No 2×2 group of cells can be entirely shaded black; (3) When two tetrominoes in adjacent regions share an edge, they must not be of the same type regardless of rotations or reflections.

This round contains eleven assorted puzzle types, some of which are either well-known puzzle types or their variants, a few others have been encountered frequently recently, and there are some that have occurred very rarely in competitive contests.

Puzzle Type	Points
Decryption	XX points
Kurotto	XX points
Domino Search	XX points
Doppelblock	XX points
Top Heavy	XX points
Sukoro	XX points
Fuzuli	XX points
Aquarium	XX points
Double Chocolate	XX points
Castle Wall	XX points
Products (Off by one)	XX points

1. **Decryption (XX points)**
   Replace the given letters with numbers from 0 to 9 such that the results of the operations are correct. Same letter should always be replaced by the same number, and different letter should always be replaced by a different number. A multi-digit number cannot start with zero.

2. **Kurotto (XX points)**
   Shade some empty (non-circled) cells black (leaving the other cells white) so that the grid is divided into non-overlapping regions; cells of the same colour are considered in the same region if they are adjacent along edges. For each given number, the total size of all black regions orthogonally adjacent to that number must match the number.

3. **Domino Search (XX points)**
   Divide the grid into a full set of dominoes. Each domino should be used exactly once. The orientation of the letters does not matter. Empty cells are not part of a domino. A checklist of the full set is provided for your convenience.

4. **Doppelblock (XX points)**
   Colour 2 squares black in every row and column. Fill the remaining white squares with the digits 1~N, so that each digit appears once in every row and column. N equals the size of the grid minus 2. The numbers on the outside indicate the sum of the digits in between the 2 black squares in that row or column.

5. **Top Heavy (XX points)**
   Place numbers into some cells so that each number in the provided range appears exactly once in each row and column. Cells may remain empty. A cell cannot contain more than one number. Some numbers are already given for you. Some cells are marked with an 'X'; you may not put a number in those cells. If two cells touch vertically, the number on top must be greater than the number on the bottom

6. **Sukoro (XX points)**
   Fill some cells with a number from 1 to 4. All numbered cells must be orthogonally connected. Orthogonally adjacent cells cannot contain the same number. Each number must indicate the number of orthogonally adjacent numbered cells. Some numbers are given to you.

7. **Fuzuli (XX points)**
   Place letters of the specified list into some cells, no more than one letter per cell, so that each letter appears exactly once in each row and column. No 2×2 group of cells can be entirely filled with letters.

8. **Aquarium (XX points)**
   Fill some cells with water so that the numbers at the borders indicate how many cells in the corresponding row or column contain water. Within an area, the cells must be filled up from the bottom up. Within a row of an area, all cells must always be filled with water or none (even if there are other areas in between).

9. **Double Chocolate (XX points)**
   Divide the grid into regions along cell boundaries. Each region must contain one connected group of light cells, and one connected group of dark cells. These groups must be the same shape, but may be rotated and/or reflected. Numbers inside a cell indicate the number of cells in the single-colored shape they are contained in.

10. **Castle Wall (XX points)**
    Draw a single closed loop (without intersections or crossings) passing through some empty cells in the grid. The grid contains some bordered or colored cells that cannot be part of the loop. Black cells must be outside the loop; white cells (with heavy borders) must be inside the loop. Numbers and arrows refer to the total sum of the lengths of loop segments in the given direction.

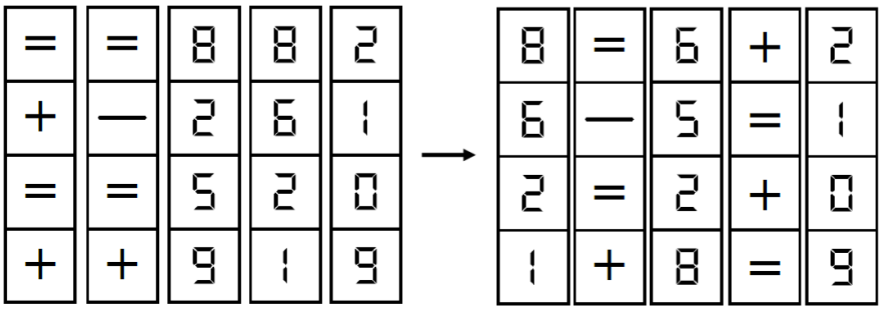
11. **Products (Off by one) (XX points)**
    Place the specified list of numbers into some cells so that each number is in exactly one cell, and no cell has more than one number. (Most cells will remain empty). Each row and each column must contain exactly two numbers. Numbers outside the grid, when given, are 1 more or 1 less than the product of the two numbers in that row or column

This round contains eleven puzzle types, which can be classified as visual, casual, basic arithmetic, word and intuitive types. Some of the types are known types while others are new types.

Puzzle Type	Points
Numerical Jigsaw 1	XX points
Numerical Jigsaw 2	XX points
Mark My Puzzles 1	XX points
Mark My Puzzles 2	XX points
Mark My Puzzles 3	XX points
Mark My Puzzles 4	XX points
Mark My Puzzles 5	XX points
Mark My Puzzles 6	XX points
Mark My Puzzles 7	XX points
Mark My Puzzles 8	XX points
Mark My Puzzles 9	XX points
Arithmetic Square	XX points
Letter Weights	XX points
Tote Bag	XX points
Meteor Shower	XX points
Three Steps	XX points
Banners	XX points
IPC Criss-Cross	XX points
Curve Data	XX points
Tom Tom	XX points

1-2 **<u>Numerical Jigsaw (XX points)</u>**

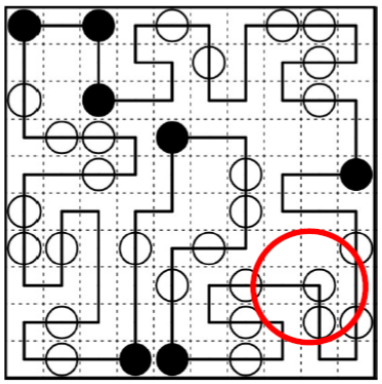
Rotate and rearrange the given vertical strips so that they form four valid equations. Operations are done from left to right. Reflection is NOT allowed.



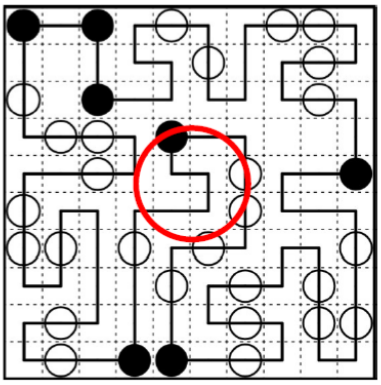
3-11 **Mark My Puzzles (XX + XX + XX + XX + XX + XX + XX + XX + XX points)**

Let us take a break from solving, and mark papers instead! For each given puzzle solution, mark whether the solution/answer is correct or incorrect. The puzzle types that will be used are LITS, Masyu, Nurikabe. The below examples are for Masyu.

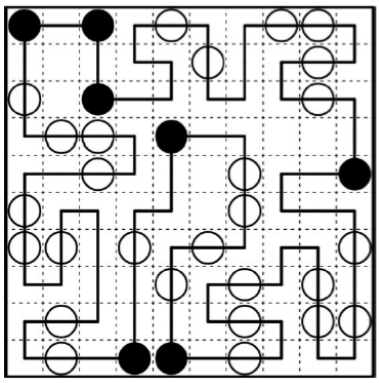
Please refer to the earlier rounds for the rules of these puzzle types.



CORRECT ☐
INCORRECT ☑



CORRECT ☐
INCORRECT ☑



CORRECT ☑
INCORRECT ☐

12. **Arithmetic Square (XX points)**

Place each digit from 1 through 9 into the white boxes (a different digit per box) so that the indicated equations or relations are correct when evaluating from left to right or top to bottom (ignore the usual order of operations).

□	+	□	+	□	> 23
+		−		+	
□	×	□	÷	□	= 8
×		×		−	
□	×	□	+	□	= 11
=		=		=	
75		8		9	

9	+	8	+	7	> 23
+		−		+	
6	×	4	÷	3	= 8
×		×		−	
5	×	2	+	1	= 11
=		=		=	
75		8		9	

13. **Letter Weights (XX points)**

Write a number under each letter so that the numbers corresponding to the letters in each given word have the given sum. Different letters must correspond to different numbers. The range of allowed numbers is given below the puzzle.

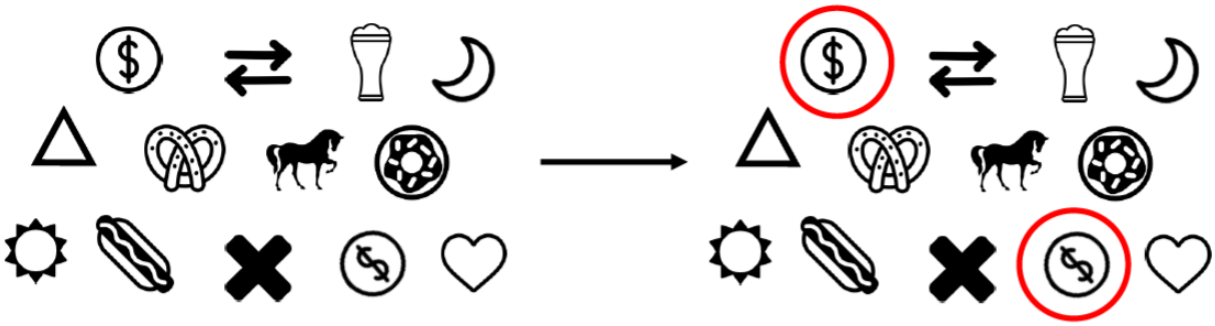
A	B	C	D	E
Numbers:	1	2	3	4	5

CAB = 11
BEE = 7
ABE = 8

A	B	C	D	E
2	5	4	3	1

14. **Tote Bag (XX points)**

Find the two identical pictures. Differences will be reasonably clear and will not be due to colour, gradient or pixelation.



15. **Meteor Shower (XX points)**

Find all listed words in the grid. The words will be found in a snake-like shape. This means that it won't be found in a straight line. All words will turn at each step, and will never share letters or cross paths with other words.

M	R	D	N	E
A	Y	A	D	U
P	E	H	I	S
I	N	R	E	D
H	S	C	Y	S

→

M	R	D	N	E
A	Y	A	D	U
P	E	H	I	S
I	N	R	E	D
H	S	C	Y	S

ERIDANUS
HYDRA
PISCES

R	I	D	R	
T	Y	C	A	
H	S	B	T	

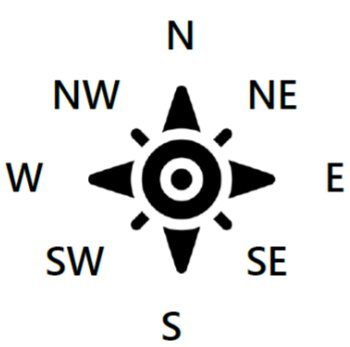
E	O	S	H	S
P	I	L	Y	E
T	G	S	C	D
C	A	A	R	L

Invalid examples:

- Path cannot go straight, must always turn
- Paths cannot cross each other

16. **Three Steps (XX points)**

Find the starting cell, such that, if the directions on the cell are followed, you will reach the treasure in exactly three steps. The correct path will NOT pass through any skulls.



2S	1SE		2W
2E	1E		2SW
	1NE		1SW
2N	2N	2NW	2NW

→

2S	1SE		2W
2E	1E		2SW
	1NE		1SW
2N	2N	2NW	2NW

17. **Banners (XX points)**

Several banners have been obscured and possibly reflected. Figure out which of the listed words belongs to which banner. All listed words appear exactly once each.

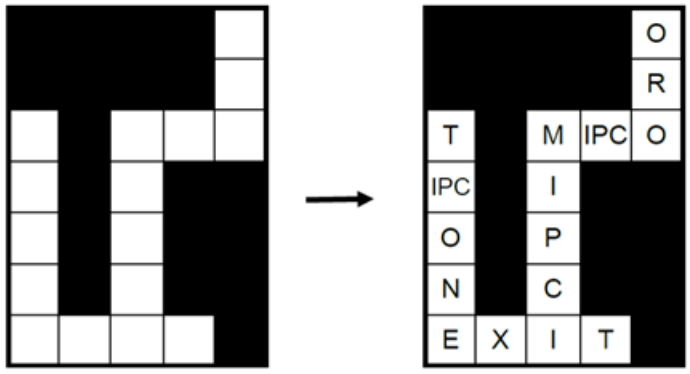
DOLL
FLAG
FROG
GOLF

1 = GOLF
2 = FROG
3 = DOLL
4 = FLAG

18. **IPC Criss Cross (XX points)**

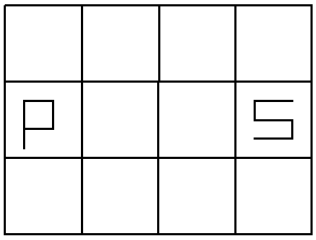
Fill in the listed words into the criss-cross, one letter per box, so that each word is read from top to bottom or left to right. A consecutive string of I-P-C may sometimes be compressed into a single box.

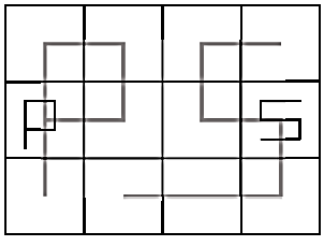
EXIT
MIPCI
MIPCO
ORO
TIP CONE



19. **Curve Data (XX points)**

Make some figures by drawing lines through the centre of cells so that each figure goes through just one clue. All cells are visited by lines. A clue shows how the line passing through it turns and connects with itself, without any rotation or reflection. However, the clue does not specify length of each straight segment of the line in any way - the lengths of straight segments may vary, but must not be 0.

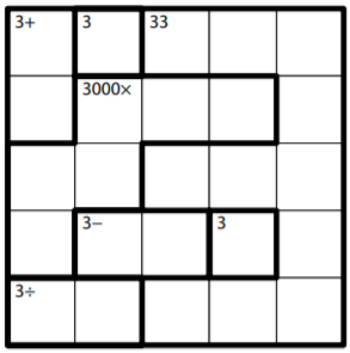




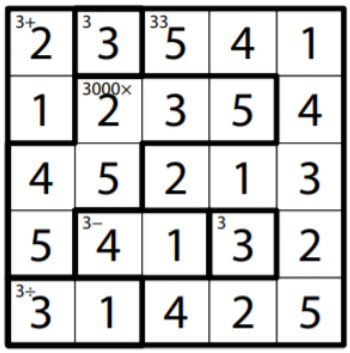
20. Tom Tom (XX points)

Insert a digit from 1 to N into each cell in the N by N grid so that no digit repeats in any row or column. Also, the number in the upper-left corner of each bold cage indicates the value of a mathematical operation (addition, subtraction, multiplication, division) applied successively to all digits in the cage, starting with the largest digit for subtraction and division (e.g. 1,2,4 with subtraction is a 1- clue as 4-2-1 = 1). The operation may or may not be given in the cage, but at least one of the four operations must apply. Digits can repeat within a cage.

{1-5}



{1-5}



This round consists entirely of puzzles which have areas of two existing compatible puzzle types (neighbours) combined in a single grid. Each puzzle has a single solution satisfying all of the constraints of each area, as well as the global constraints shared by both puzzle types.

For each puzzle, the areas of the two puzzle types are adjacent to each other and part of a larger single puzzle, and there will be interactions between areas of each type.

The round contains six puzzles, two for each of the hybrids listed below.

Puzzle Types	Points
Tapa - Nurikabe 1	XX points
Tapa - Nurikabe 2	XX points
Railroad Tracks - Masyu 1	XX points
Railroad Tracks - Masyu 2	XX points
Ayeheya - YajiKazu 1	XX points
Ayeheya - YajiKazu 2	XX points

1-2 Tapa - Nurikabe (XX + XX points)

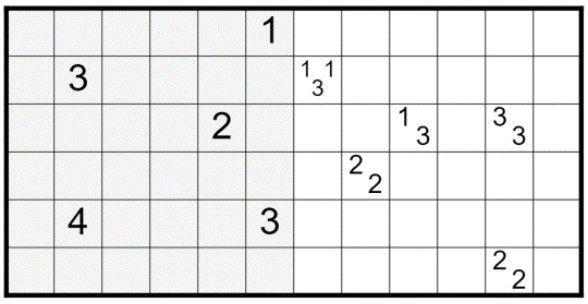
The solution to the entire puzzle will contain a single group of shaded grid cells interconnected with each other by horizontal and vertical adjacency, in which no set of four grid cells which share a corner is completely shaded. Grid cells which contain numbers cannot be shaded.

In any **Tapa area** of the grid, the number(s) in any numbered grid cells describe the contents of the squares immediately surrounding the numbered grid cell (and only those cells). Numbers in a numbered grid cell will be listed in ascending order and correspond to the areas of connected shaded cells in the eight squares surrounding the numbered grid cell. If a numbered grid cell contains the number 0, none of the squares surrounding the numbered cell are shaded.

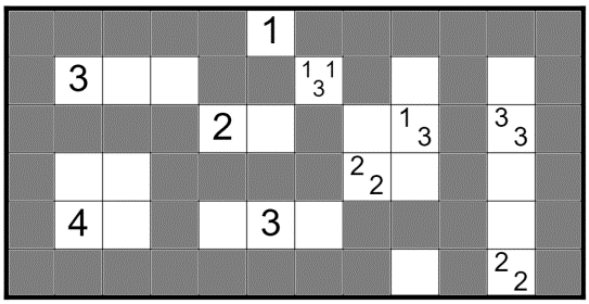
In any **Nurikabe area** of the grid, any unshaded grid cell is part of a group of one or more unshaded connected grid cells which contains exactly one numbered cell, which is equal to the area in grid cells of the group. (These unshaded connected grid cells are referred to as islands) All grid cells in the group must be interconnected via horizontal or vertical adjacency only.

Nurikabe islands can extend into Tapa areas, and the sole numbered cell for the island may be a Tapa clue.

Any Nurikabe area of the puzzle will have a light gray background color.



(Light gray shading in left half of the grid)



3-4 Railroad Tracks - Masyu (XX + XX points)

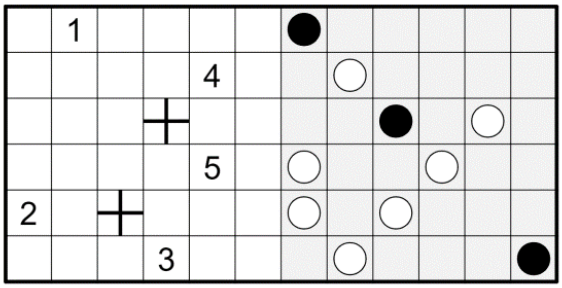
The solution to the entire puzzle will contain a single closed loop. Traversing the loop in the correct direction starting from 1 will traverse all of the numbers in ascending order.

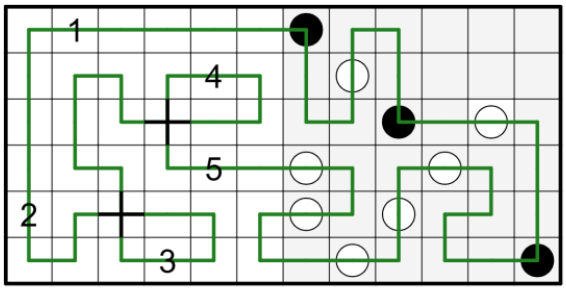
In any **Railroad Tracks area** of the grid, every grid cell must be part of the loop; the path may only cross itself in the grid cells where a crossing is already in place; and the path cannot turn when it passes through any of the numbers (stations).

In any **Masyu area** of the grid, the path may not cross itself; the path must not turn when it passes through a black pearl and must travel to at least the second grid cell beyond the pearl before turning again; and the path may not turn when travelling through a white pearl but must turn in the grid cell immediately before it passes through the white pearl and/or the grid cell it passes through immediately after.

Any Masyu area of the puzzle will have a light gray background color.

Example-





(Light gray shading in right half of the grid)

5-6 Ayeheya - YajiKazu (XX + XX points)

The solution to the entire puzzle will contain a set of shaded grid cells which are neither horizontally nor vertically adjacent to each other. The grid cells which are not shaded will form a single horizontally and vertically interconnected group.

In any **Ayeheya area** of the grid, specific areas of the grid will have borders (marked with heavier lines than the grid lines. Shaded grid cells within a specific bordered area must be placed in rotationally symmetric positions within that bordered area, and if the bordered area contains a number in the upper left, the area must contain precisely that many shaded grid cells.

In addition to this, the uninterrupted group of unshaded grid cells in a row or column which an Ayeheya cell is a part of can cross a maximum of one border. Borders, for the purposes of this rule, include all borders between Ayeheya areas of the grid and Yajisan-Kazusan areas of the grid.

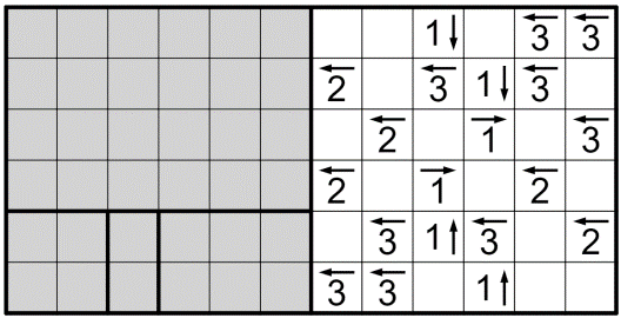
In any **Yajisan-Kazusan (Yajikazu)** area of the grid, some of the grid cells will have a number and an arrow in them.

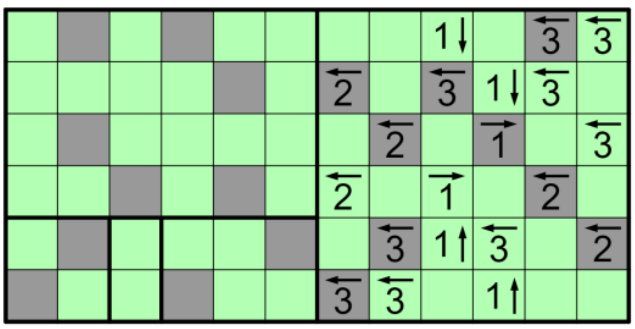
If a grid cell contains a number and arrow, and that grid cell is unshaded, then the number of shaded cells pointed at by the arrow, including any shaded cells in the Ayeheya areas, must be equal to the number in that grid cell.

If a grid cell contains a number and arrow, and that grid cell is shaded, then the number of shaded cells pointed at by the arrow, including any shaded cells in the Ayeheya areas, may or may not be equal to the number in that grid cell.

Any Ayeheya area of the puzzle will have a light gray background color.

Example-





(Light gray shading in left half of the grid)

There shall be no playoffs this year.

The final scores among the eligible participants after five rounds, including base points and bonus points, shall be used to determine the PR Winners.

Ties will be broken using following rules:

i) Maximum points in Round 3 (including bonus points in Round 3)
ii) Maximum points in Round 2 (including bonus points in Round 2)
iii) Maximum points in Round 5 (including bonus points in Round 5)
iv) Maximum points in Round 1 (including bonus points in Round 1)
v) Maximum points in Round 4 (including bonus points in Round 4)
vi) Higher base points