



# **MaPP Challenge '20 – Mindy Jonas and the Enigmatic Legacy**

*Mathematical Puzzle Programs*



MaPP Challenge '20 – Mindy Jonas and the Enigmatic Legacy

# How to Play

## Rules

### Leagues

Each team is registered in either the **Competitive or Recreational League**. If both Leagues are playing simultaneously today at your campus, then all scoring and awards are handled separately in both Leagues.

### Puzzle Packets and ClueKeeper

Each team has received multiple **Puzzle Packets**. However, there is not enough information in this packet to begin solving any puzzles.

Once the game begins, clues will become available in the **ClueKeeper** app that will allow players to begin solving puzzles in the packet. Once a puzzle is solved, its solution can be submitted via the app. As time progresses, hints for unsolved puzzles will unlock, helping teams who are stuck. The game ends when your time in ClueKeeper has expired.

### Main Puzzles

Once the game begins, you'll be presented with four **Main Puzzles**. Each Main Puzzle can be solved directly using mathematical modeling and problem-solving abilities. Once the solution for the puzzle has been entered into ClueKeeper, **1000 Victory Points** will be awarded, and the second part will be unlocked. This second part uses the first solution to extract a short word or phrase. Solving this second challenge is worth an additional **500 Victory Points**.

### Cryptic Puzzles

After solving the second part of each Main Puzzle, an additional **Cryptic Puzzle** will become available to solve. The way to solve these puzzles is left, well, cryptic. However, your team should still be able to use your critical thinking to extract a hidden word or phrase. Correct solutions are worth **500 Victory Points**.

### Bonus Puzzle

After solving all four Main Puzzles, the Bonus Puzzle will become unlocked in ClueKeeper. Your team will be asked to optimize a certain task, and present your solution to Game Control in person, which will be graded and awarded **up to 500 Victory Points**.

You may submit up to three solutions throughout the game (including any disqualified submissions), and your best solution of the three will be counted toward your score. You must bring a device with the ClueKeeper app with you to submit an answer; as long as your time has not expired when you arrive at Game Control, you will be able to submit your answer (even if you have to wait on other teams ahead of you first).

### Metapuzzle

Once your team has solved two Cryptic Puzzles, the final **Metapuzzle** becomes available, worth **1000 Victory Points**.

## Hints

Recreational teams may ask for hints at Game Control at any time during the game, and may receive direct assistance from their teachers/chaperones as desired. Competitive teams may ask Game Control for rules clarifications or help with the ClueKeeper app (including help with entering solutions for the first part of a Main Puzzle), but otherwise will only receive help via hints made available in ClueKeeper.

## Winning the Game

The team that earns the **most Victory Points out of 10000** by the end of the game is the **winner**, with ties broken based on which team solved their final non-Bonus puzzle earliest.

## Additional Rules/Advice

- Players should not do anything which would interfere with other teams solving puzzles. Be a good sport!
- Submissions for each puzzle, besides the Bonus Puzzle, are unlimited. Every submission for the Bonus Puzzle will be carefully graded by Game Control, so only three submissions are allowed.
- Before visiting Game Control to ask for a hint or clarification, make sure you've read all the material accompanying the puzzle! Chances are, your question is covered there.
- Teachers and chaperones are not allowed to help Competitive teams solve puzzles.
- Teams may use any supplies they've brought and even look things up online to solve puzzles, but Competitive Teams may not receive any direct assistance from outside their team (e.g. you can't Phone a Friend).
- Players must remain within any physical boundaries set by both Game Control and their teacher/chaperone at all times, and must always travel with a teammate when leaving their headquarters.
- Teachers/chaperones are responsible for their students at all times.
- Since this game will be played at different campuses on different days, please do not spoil any of today's puzzles or solutions online until the game book is released publicly by MaPP!
- Contact Game Control immediately in the case of emergency or any issues with these rules.



## MaPP Challenge '20 – Mindy Jonas and the Enigmatic Legacy

# Game Resources

## Reference Sheet

Letter	Decimal	Binary	Morse	Braille	Letter	Decimal	Binary	Morse	Braille
A	1	00001	.-	⠠	N	14	01110	-.	⠠
B	2	00010	-...	⠡	O	15	01111	---	⠡
C	3	00011	-. -.	⠢	P	16	10000	.-..	⠢
D	4	00100	-..	⠣	Q	17	10001	--.-	⠣
E	5	00101	.	⠤	R	18	10010	.-.	⠤
F	6	00110	..-.	⠥	S	19	10011	...	⠥
G	7	00111	--.	⠦	T	20	10100	-	⠦
H	8	01000	....	⠧	U	21	10101	..-	⠧
I	9	01001	..	⠨	V	22	10110	...-	⠨
J	10	01010	.-...	⠩	W	23	10111	.-.-	⠩
K	11	01011	-.-	⠪	X	24	11000	-..-	⠪
L	12	01100	.-..	⠬	Y	25	11001	-.--	⠬
M	13	01101	--	⠭	Z	26	11010	--..	⠭

### Some famous numbers and lists

$\sqrt{2} \approx 1.41421\ 35623\ 73095\ 04880\ 16887\ 24209\ 69807\ 85696\ 71875\ 37694\ 80731\ 76679\ 73799\ 07324\ 78462\ 10703\ 88503\ 87534\ 32764\ 15727$

$e \approx 2.71828\ 18284\ 59045\ 23536\ 02874\ 71352\ 66249\ 77572\ 47093\ 69995\ 95749\ 66967\ 62772\ 40766\ 30353\ 54759\ 45713\ 82178\ 52516\ 64274$

$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510\ 58209\ 74944\ 59230\ 78164\ 06286\ 20899\ 86280\ 34825\ 34211\ 70679$

Prime numbers less than 200:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 193, 197, 199

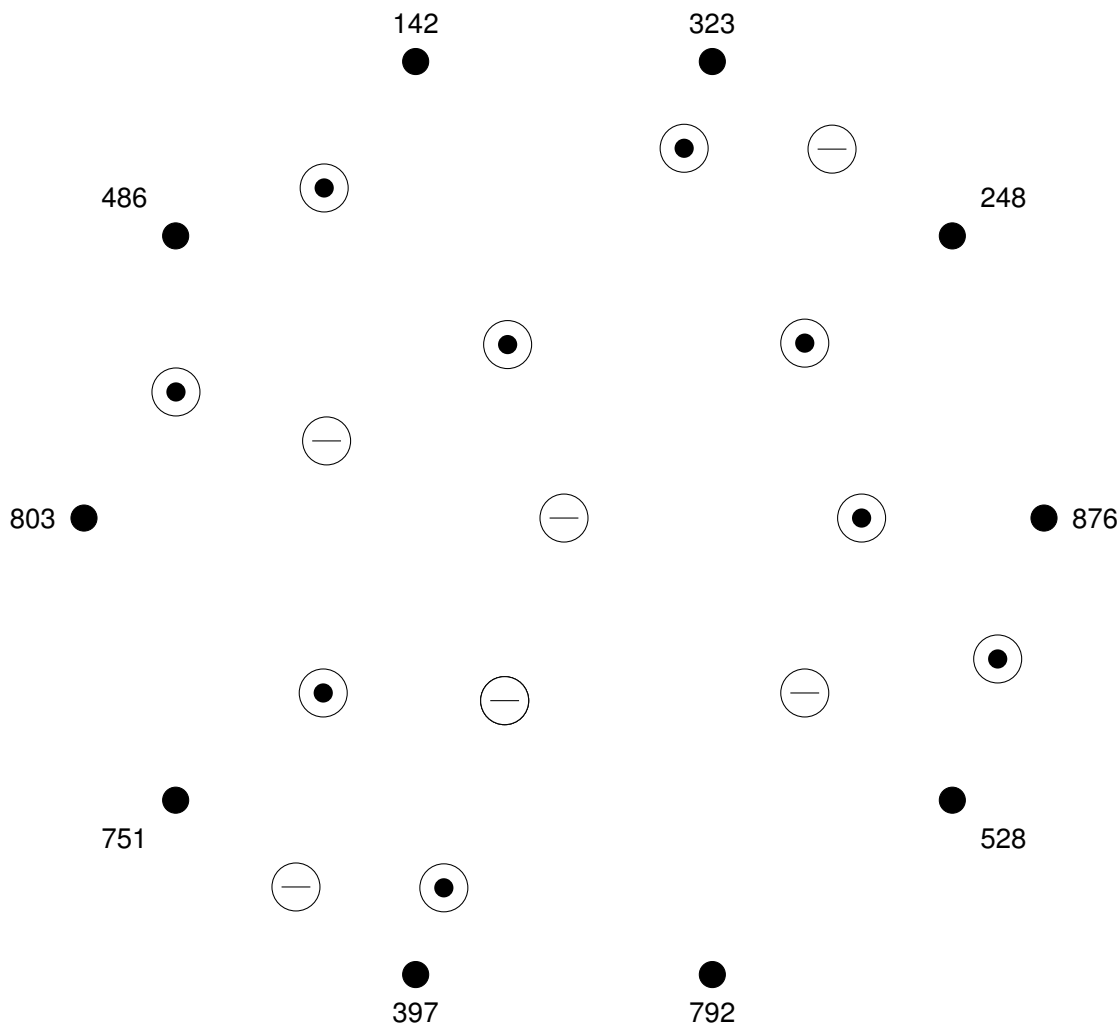
Square numbers less than 400:

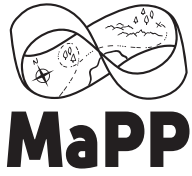
0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361



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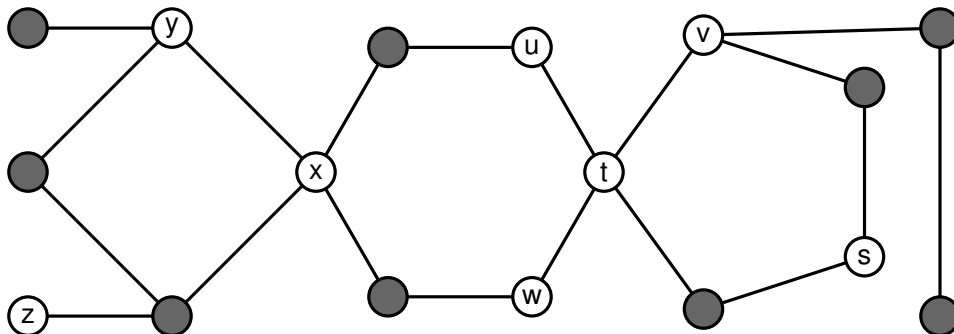
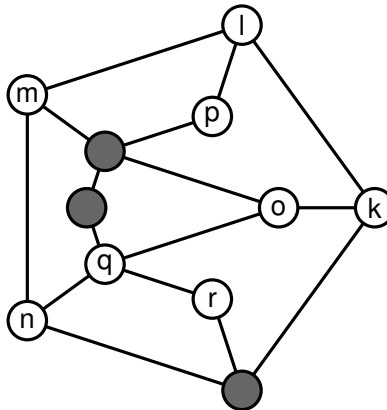
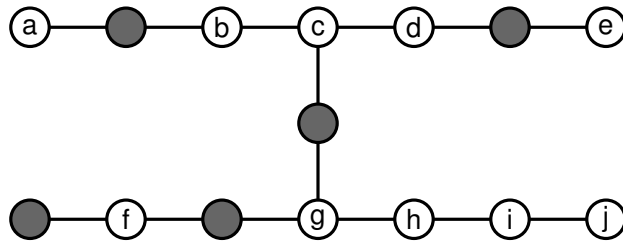
## Journal: January 20



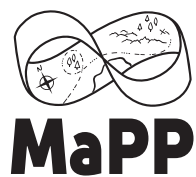


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## Journal: February 05

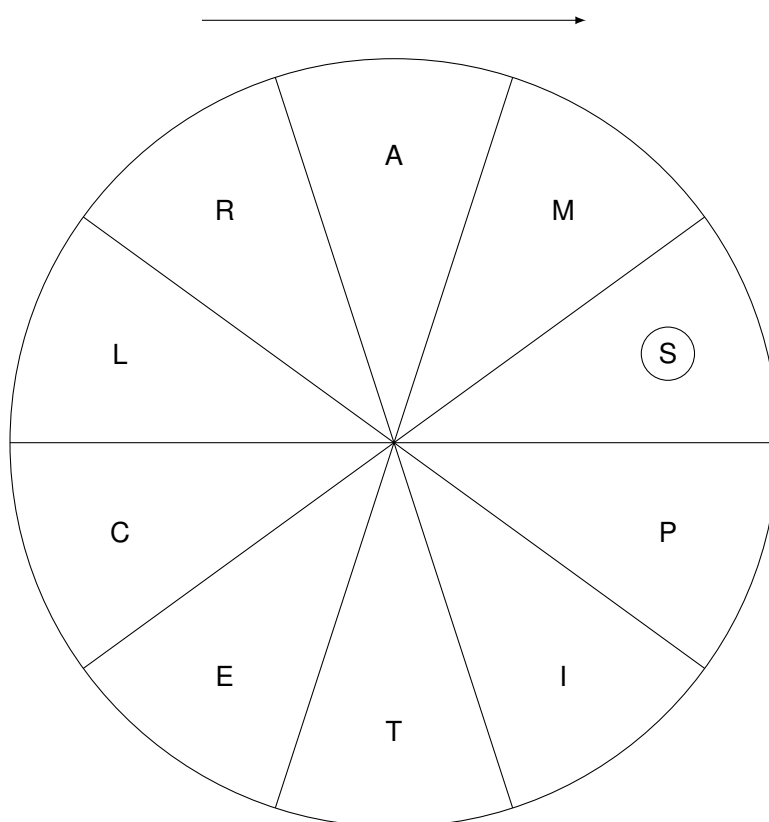


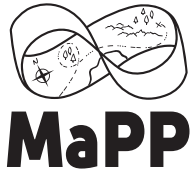
TOTAL BUDGET: \$12000



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## Journal: March 16





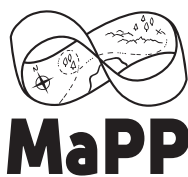
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## Journal: April 03

k u  
b p j  
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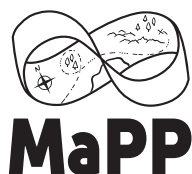




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## Journal: June 28

Journal	entry	June	28,	3513		
	Successful	dig	today.	We	found	a
lot	of	pot	shards,	some	with	remarkably
intact	artwork.	Like	in	the	tomb,	there
are	scenes	of	men	with	circles	around
their	heads,	looking	to	the	sky.	We
believe	these	represent	past	kings,	deities,	or
maybe	both.	I	recall	my	advisor's	words,
"people	are	not	pots."	I	should	be
careful	before	drawing	any	firm	conclusions.	On
the	other	end	of	the	site	from
the	tomb	we	found	a	burial	site.
It	was	lined	with	red	ochre,	the
bodies	were	facing	east	with	their	arms
folded.	Already	this	site	has	yielded	so
much.	If	only	the	university	understood.	They
want	to	save	money	so	badly,	but
what	is	it	for	if	not	this?



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## Journal: July 21

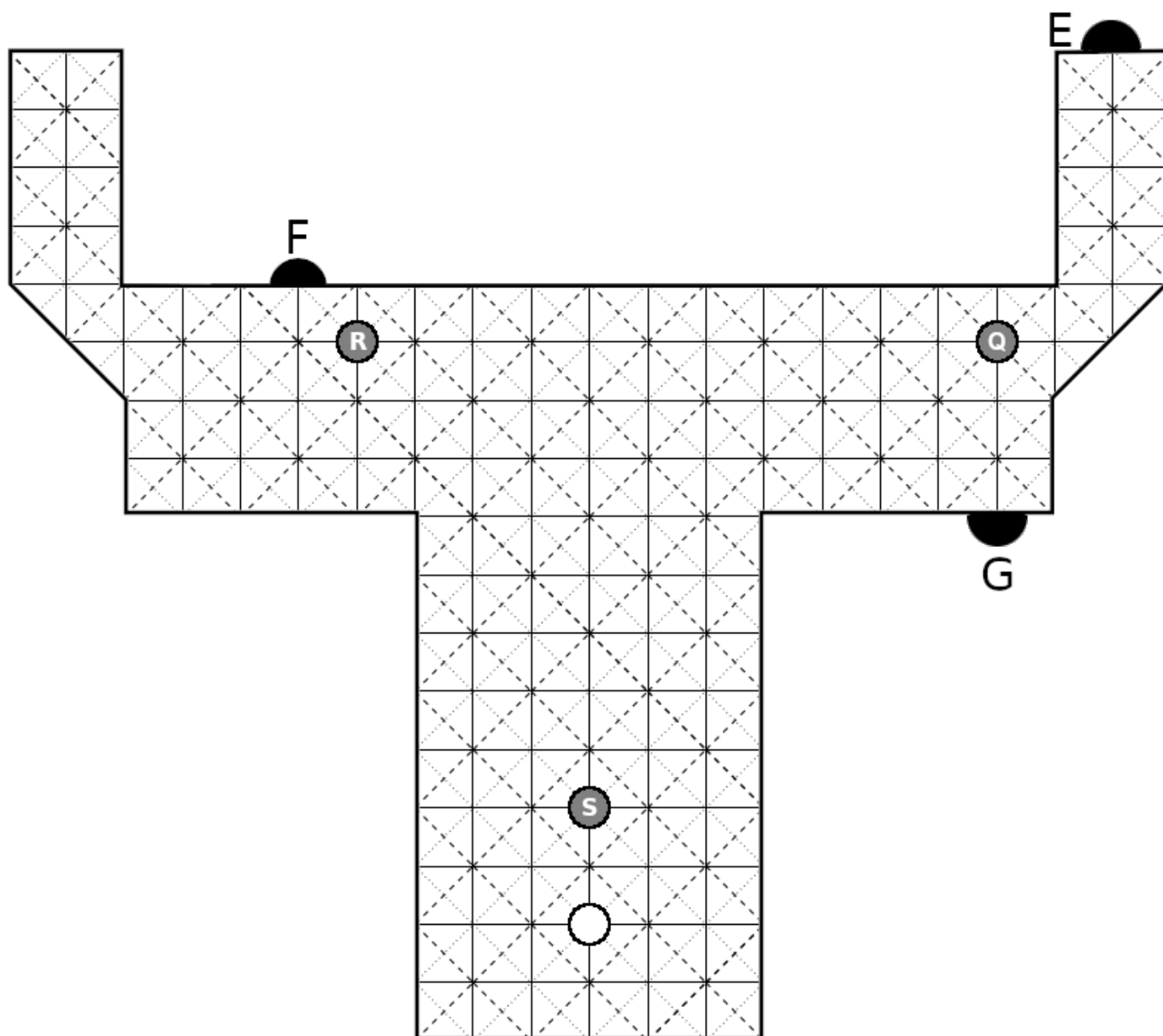
Budgeting and begging for grants isn't the most exciting aspect of archaeology, but I suppose it's a necessary evil.

Topic	Detail	Budget Code	Cost
Field work salary	Dr. M. Jonas	N	\$12,717
Field work salary	B. Fraiser	P	\$1,982
Travel expenditures	Lodging	F	\$3,291
Excavation	Digging equipment	Q	\$20,183
Excavation	Artifact cleaning and cataloging	A	\$8,215
Research	Osteology consultant	C	\$6,499
Research	Ceramic analysis	Q	\$7,211
Research	Floral analysis	K	\$5,525
Research	Faunal analysis	Q	\$5,527



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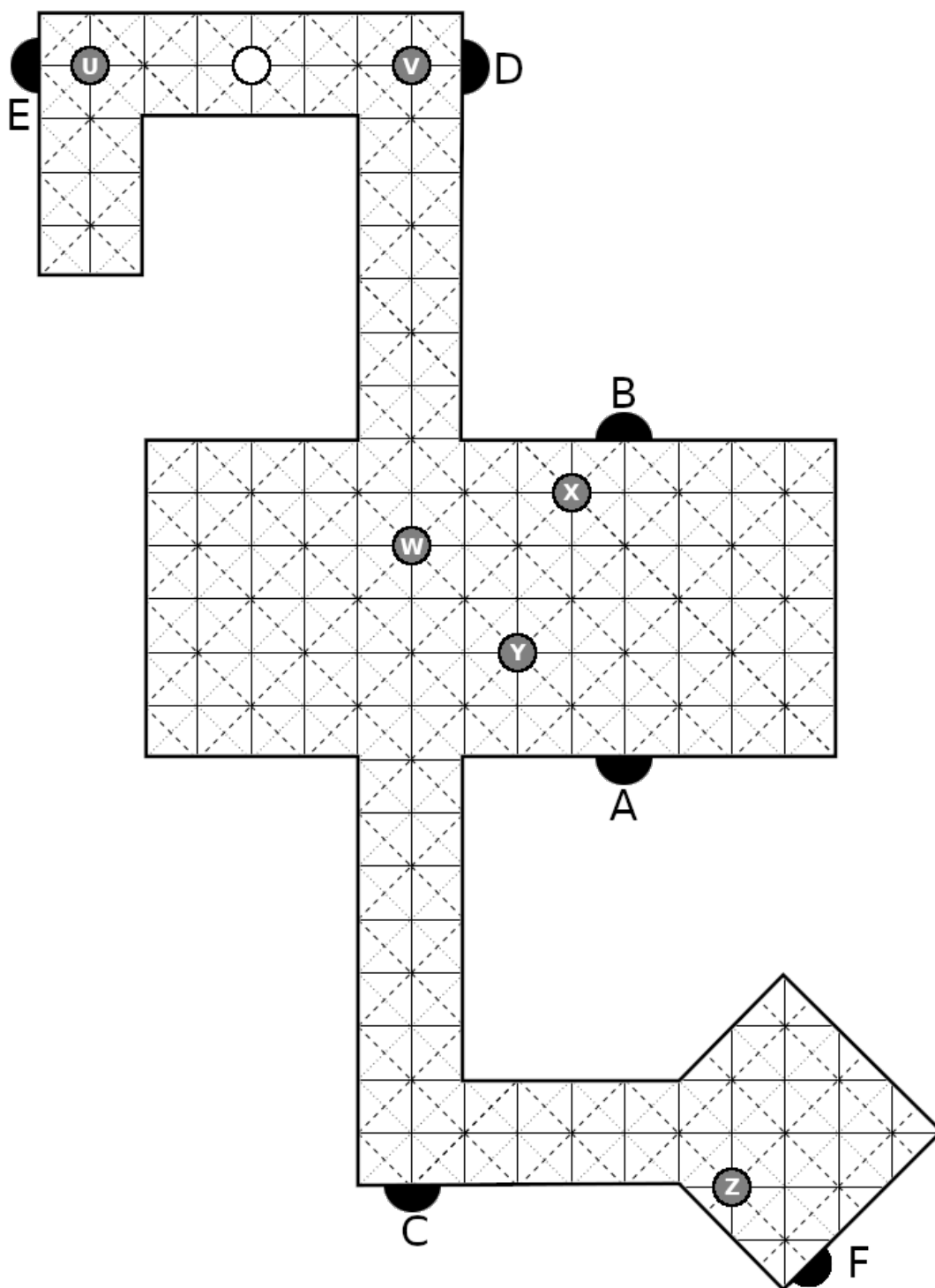
**Journal: August 09**





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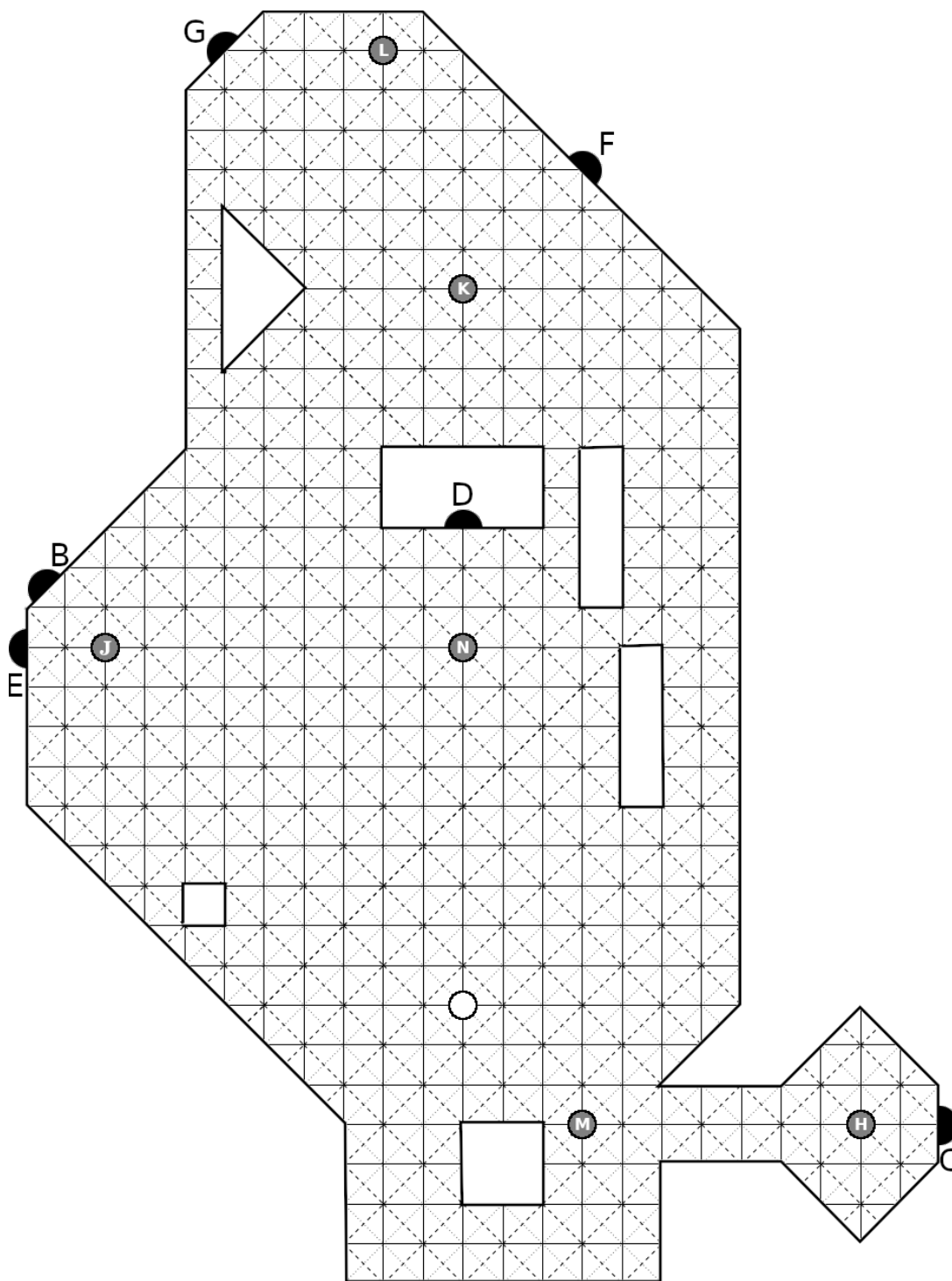
**Journal: August 10**





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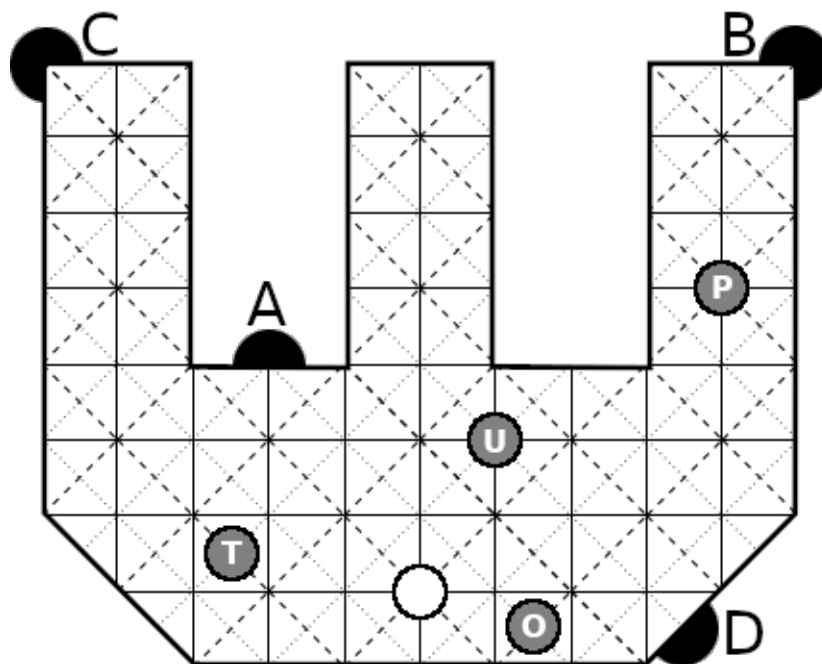
**Journal: August 11**

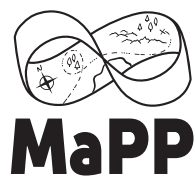




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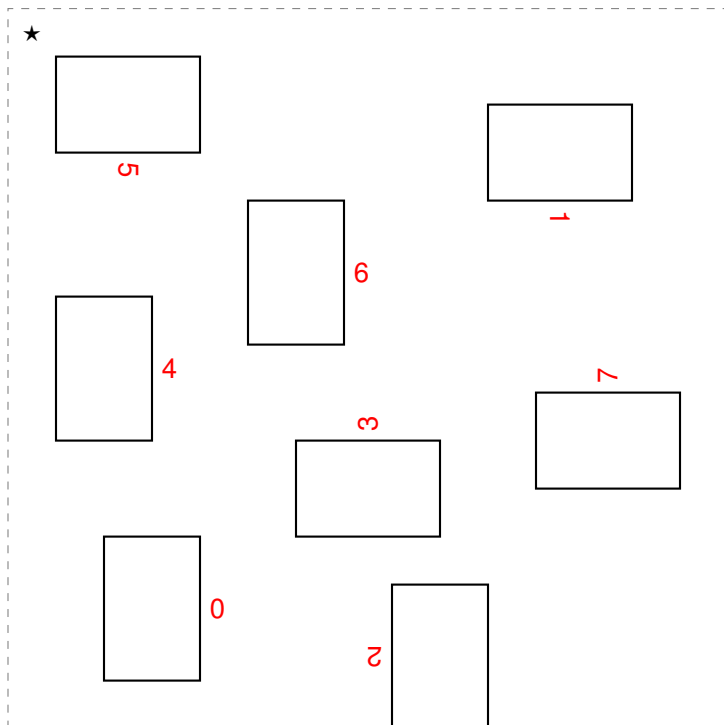
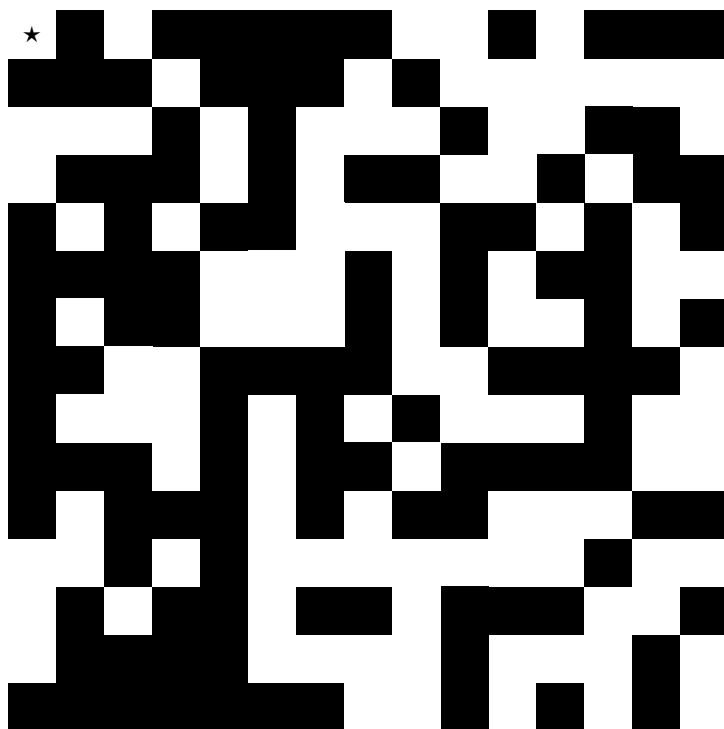
## Journal: August 12





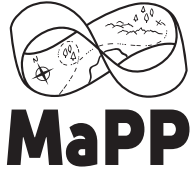
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## Journal: September 18









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## Journal: November 01

Village market:

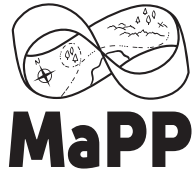
1. M to 2A and L?
2. 2A to 2L?
3. A to 3A and M?
4. A to 3A?
5. A to L?

Market square:

1. 2T to 3F and 3Q?
2. T to 50T?
3. T to T and F?
4. T to Q?
5. T to 3T?

Black market:

1. S to 2S?
2. 2S to S and 2B?
3. 3S to 3C?
4. S to B and 2C?
5. 4S to 2S, 2B, and 5C?



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## Journal: December 25

❖ What A Splendid Day! Ever Since Champollion  
❖ Discovered The Wall Paintings In The Third  
❖ Dynasty Tomb, We've Known That Like Other  
❖ Ancient Peoples, The Fregians Had A Ball  
❖ Game, Yet No Arenas Or Equipment Had  
❖ Ever Been Found. That Changed Today. I  
❖ Have Very High Confidence That The Ruins  
❖ We Discovered Are Indeed The Remains Of  
❖ One Of These Ancient Collusiums. While Everyone  
❖ Thought That The Wall Paintings Were Exaggerated,  
❖ Boulders Over Five Meters In Diameter Were  
❖ Used In This Sacred Game! How Fascinating!





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## Journal: Undated Entry #1

First



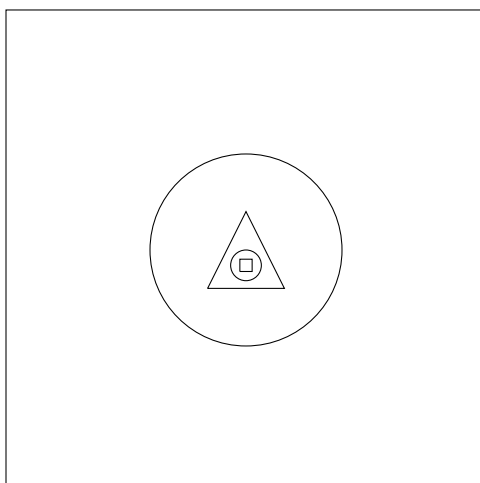
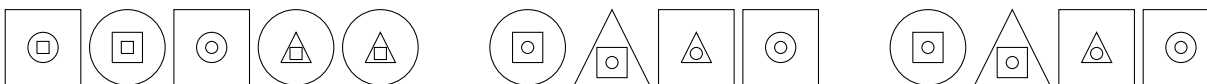
Second

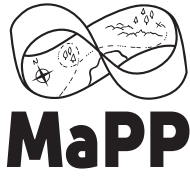


Third



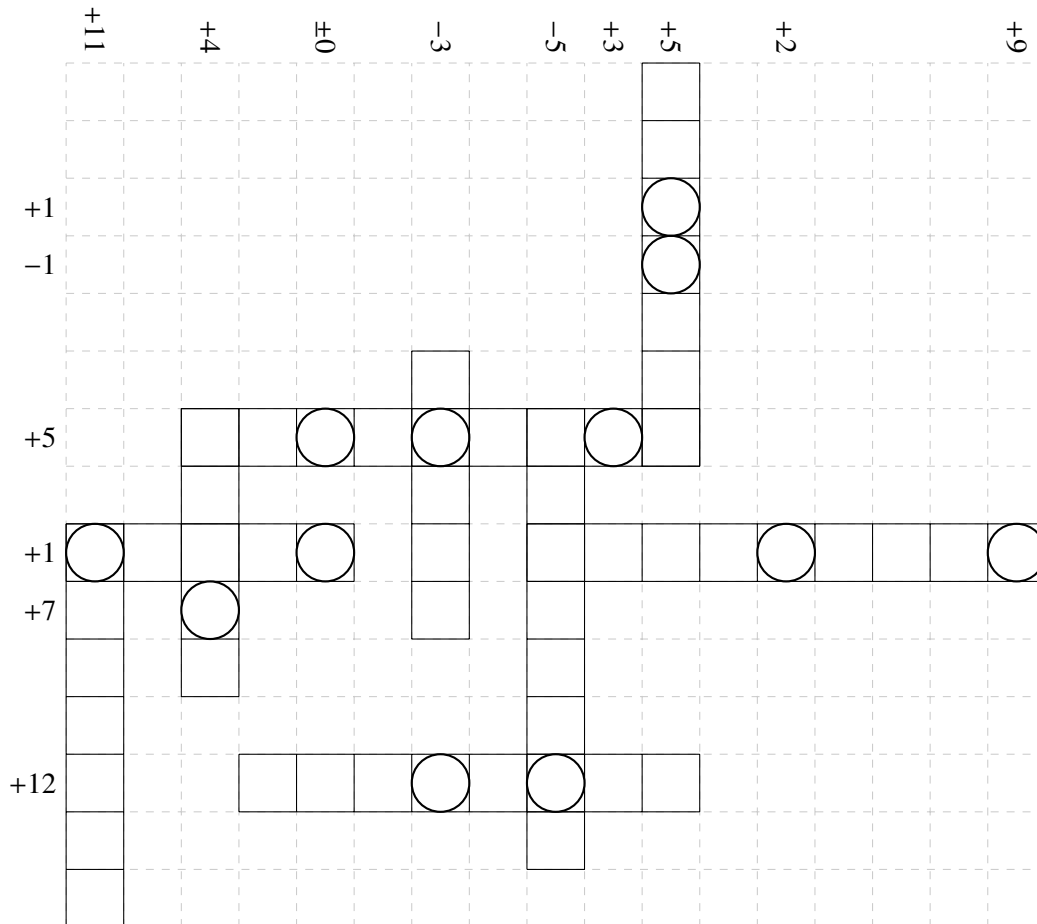
Fourth





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## Journal: Undated Entry #2



GREEK

SCHOLAR

POLYMATH

INVENTOR

GEOGRAPHY

\_\_\_\_\_

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