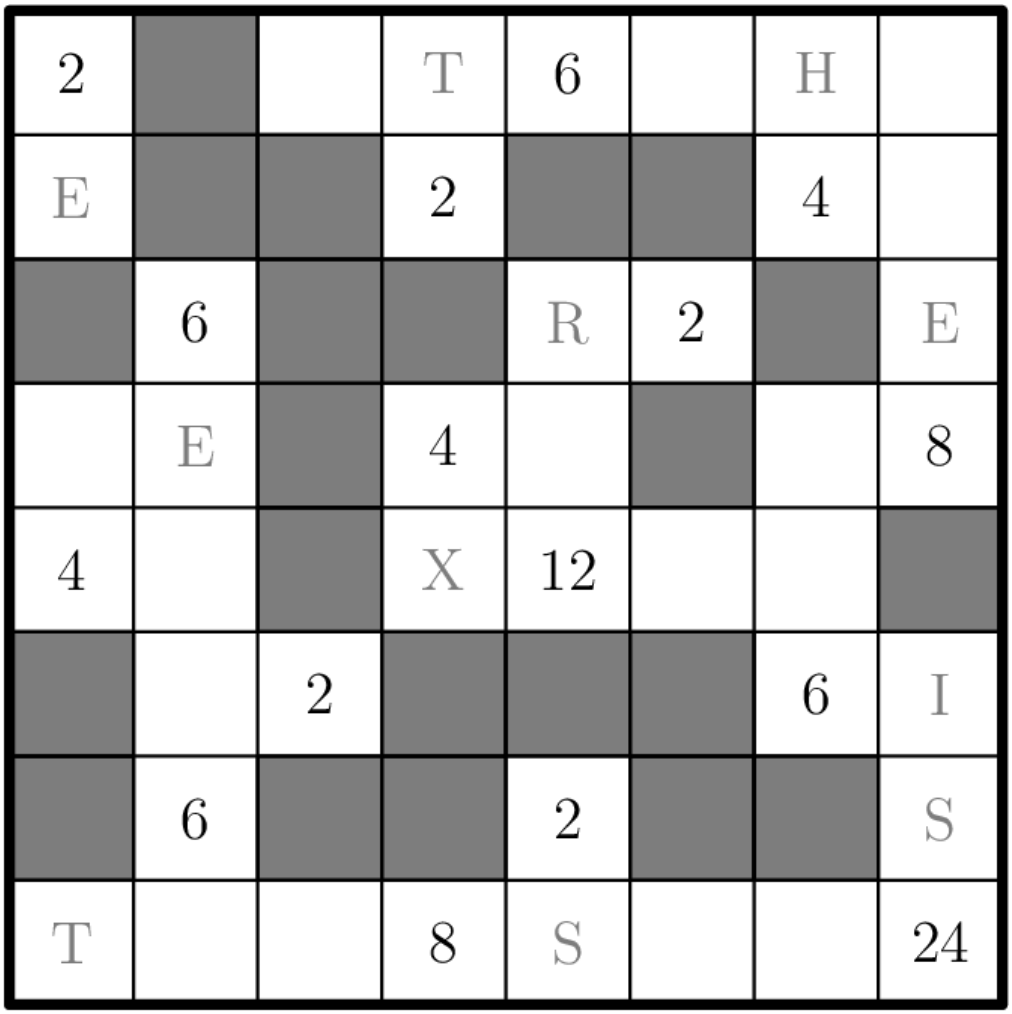
Mu Alpha Theta Puzzle Hunt Solutions

Puzzle 1

Shade some cells so that each number gives the product of the number of cells it can see along its row and the number of cells it can see along its column. A number can see all unshaded cells (including itself) that are not blocked.

2	A		T	6		H	
E	L		2	L		4	
	6	N		R	2	I	E
	E	T	4		S		8
4			X	12			M
L		2		A		6	I
E	6			2		O	S
T			8	S			24

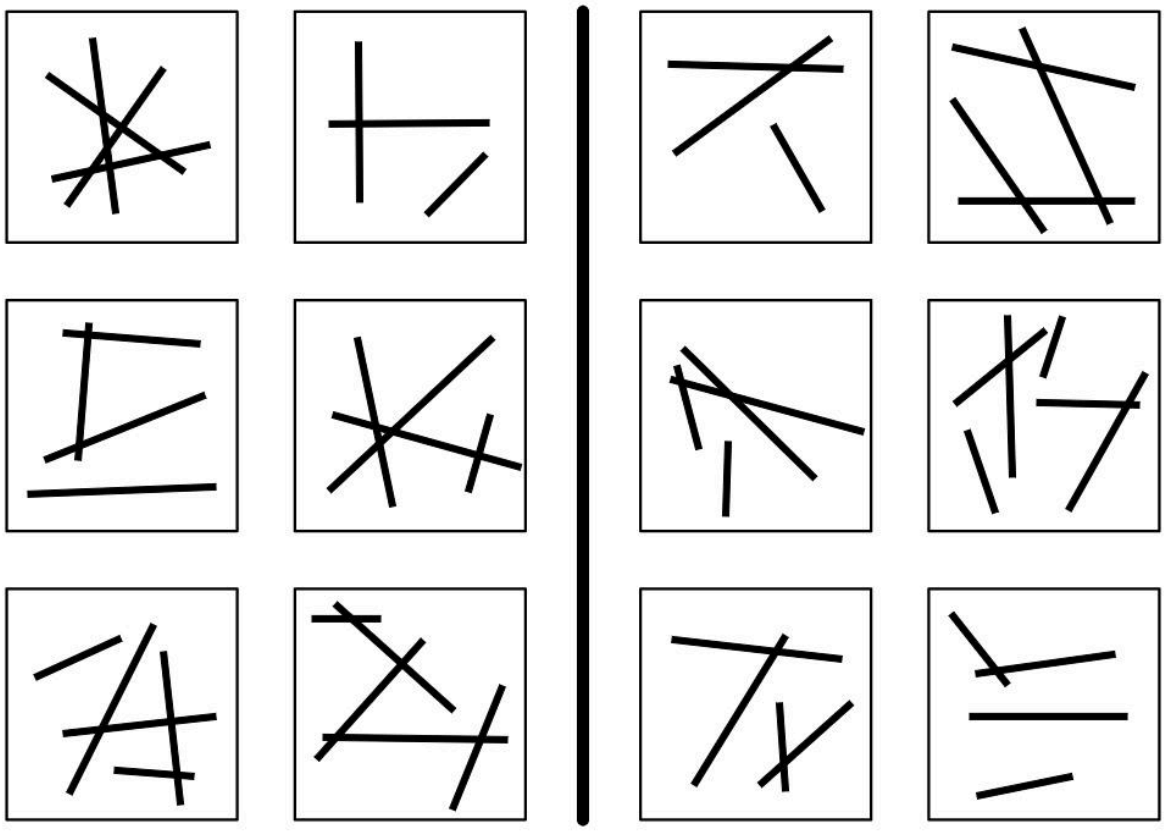
Puzzle 1 Solution: THERE EXISTS



The unshaded letters from top to bottom in reading order spell out "THERE EXISTS."

Puzzle 2

The 6 images on the left are separated from the 6 images on the right, but **why**?



Puzzle 2 Solution: PERPENDICULAR

Every picture on the left has a pair of PERPENDICULAR lines, and none of the pictures on the right do.

(Any synonym of this answer such as "right angle," "orthogonal," etc. is equally correct. The only important thing is later to use the math symbol for perpendicular, ⊥.)

Puzzle 3

"It's as easy as ONE, TWO, THREE!"

Y = 20, 21, 22, 23, 24, 25…

O = 1, 2, 4, 14, 21, 22, 24…

U = 4, 14, 24…

__ = 3, 4, 13, 14, 23, 24…

__ = 6, 7, 16, 17…

__ = 1, 2, 4, 14, 21, 22, 24…

__ = 11, 12…

__ = 4, 14, 24…

__ = 2, 3, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

__ = 5, 6, 8, 9, 13, 15, 16, 18, 19, 25…

__ = 1, 2, 4, 14, 21, 22, 24…

__ = 1, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

__ = 5, 6, 8, 9, 13, 15, 16, 18, 19, 25…

__ = 6, 7, 16, 17…

__ = 5, 6, 8, 9, 13, 15, 16, 18, 19, 25…

__ = 1, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

__ = 2, 3, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

__ = 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21…

__ = 3, 4, 13, 14, 23, 24…

__ = 6, 7, 16, 17…

__ = 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21…

__ = 10000000000000000000000000000, 100000000000000000000000000001…

__ = 2, 3, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

__ = 5, 6, 8, 9, 13, 15, 16, 18, 19, 25…

__ = 1, 2, 4, 14, 21, 22, 24…

__ = 1, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24…

Puzzle 3 Solution: INTERSECTION

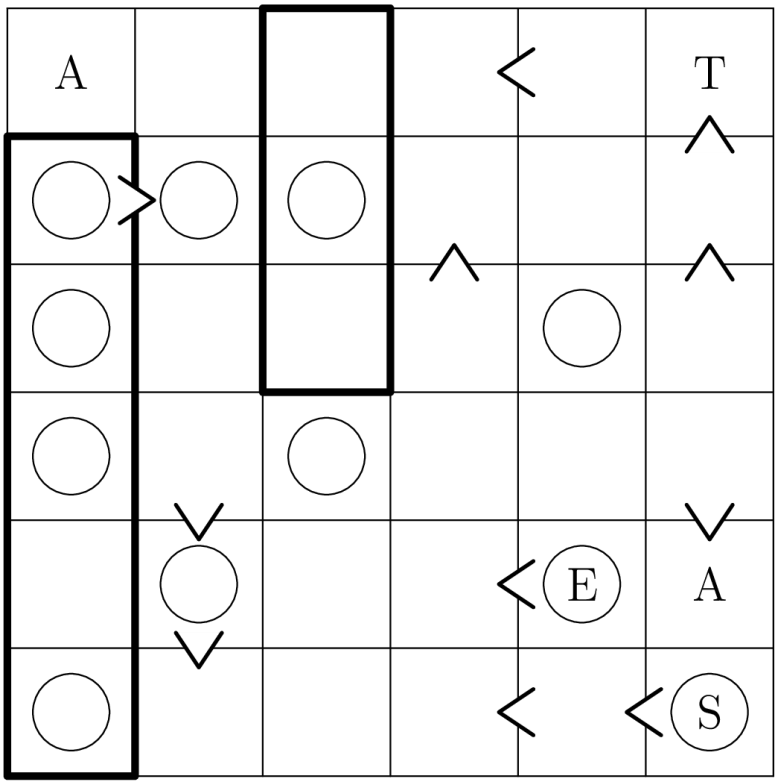
Spell out each numeral in a row and take a letter that belongs to each spelling. That becomes the value of the row. For example, the Y is the common character in twent**y**, twent**y**-one, twent**y**-two, twent**y**-three, etc. The O is the common character in **o**ne, tw**o**, f**o**ur, f**o**urteen, etc. The completed message spells out

YOUR SOLUTION IS INTERSECTION

The C is the most unusual letter, coming from the number 'o**c**tillion.'

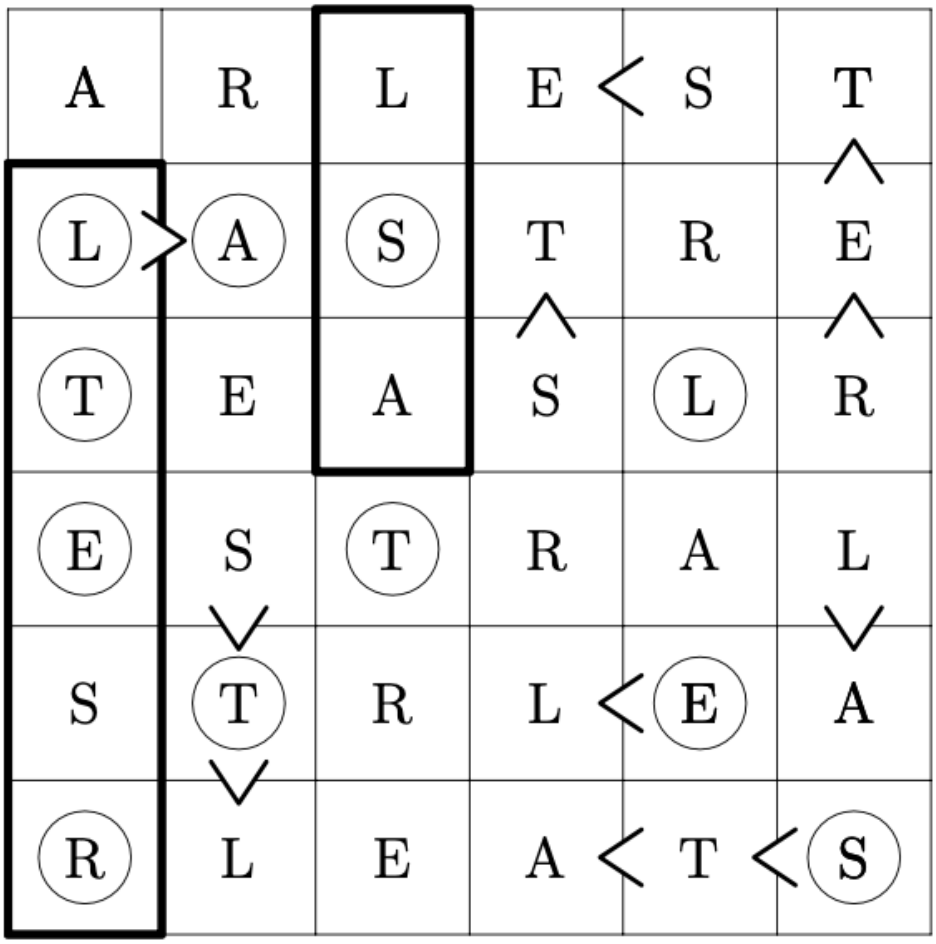
Puzzle 4

- Anit, Erp, Luis, River, Sage, and Takeru all have different heights.
- No one is both taller than Erp and shorter than Takeru.
- No one is both shorter than Erp and taller than Takeru.
- Sage is shorter than at least one of River and Takeru.
- Sage is taller than at least one of Anit and Erp.
- Erp is shorter than either Luis or River, but not both.
- Erp is taller than either Anit or Sage, but not both.



Puzzle 4 Solution: SUPERSET

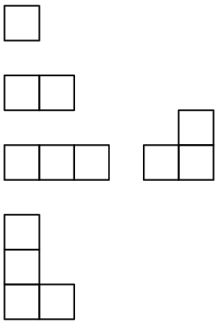
We can use a combination of logic from the instructions and the inequality symbols and Latin square property to fill out the grid as follows:



Then in reading order from top to bottom, the circled letters spell LAST LETTERS. This is a clue to use the last letter of the names Ani**t**, Er**p**, Lui**s**, River, Sag**e**, Taker**u**. Using each of those last letters by reading down the two boxed columns, we get the final answer **superset**.

Puzzle 5

A "region" is a group of 1–4 cells connected along sides (not corners). Here are examples of valid regions:



Divide the grid on the left into 40 regions, and place a number in each cell, so that:

- Each row and column contains one 1, two 2s, three 3s, and four 4s.
- The number in each cell is the area of the region it is a part of.
- All regions of area 4 are shaped like "L"s, as in the example above, possibly reflected and/or rotated.

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

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

Puzzle 5 Solution: FOR ALL

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

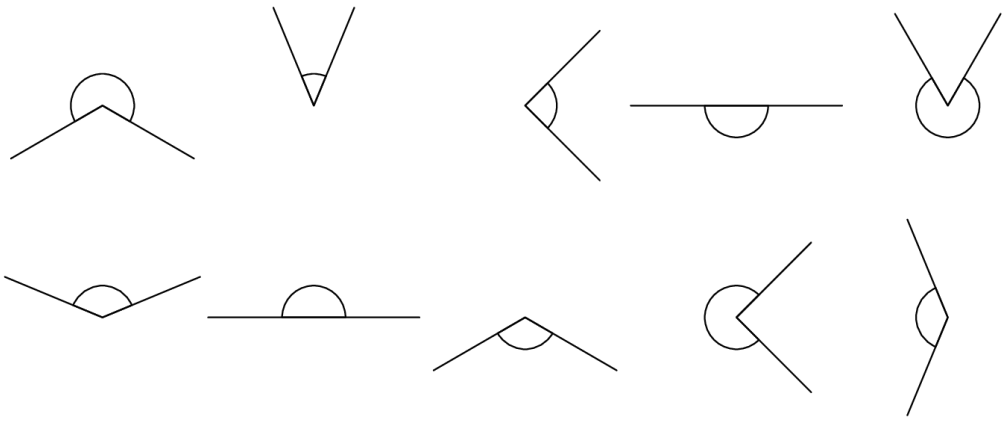
When you look at only the letters that the 3s fall on in the letter grid, you get

			W	H					A
T				W					O
R					D				S
F					O	L			
		L					O	W	
	A	L						L	
			F		O	R			
			O	N		E			
	A						N	D	
	O	N					E		

In reading order from top to bottom, this spells the message "WHAT WORDS FOLLOW ALL FOR ONE AND ONE." The answer is "FOR ALL." (There is also a bit of a nod at the Three Musketeers since we are tracking the position of the 3s.)

Meta

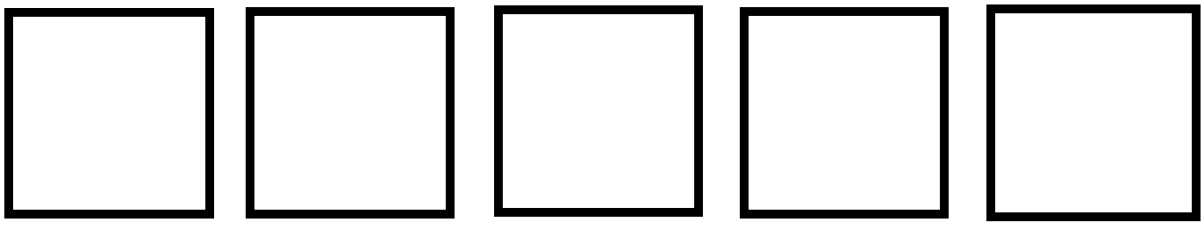
You step through the door and let out an involuntary groan: directly ahead, the hallway branches into *ten* different paths, each one marked with a peculiar symbol.



You shine your light down each passage, but they all look identical and seem to go on for miles. Your suit still has several hours' worth of oxygen left in it, but even that won't be enough to explore every single path. It seems you have no choice but to use reasoning to determine which is the correct one. (Darn!)

As you step forward to examine the symbols more closely, you notice that the ground before the branching point has five large squares etched into it, along with some sort of riddle.

There is a normal path forward, but does it overlap with the one you seek?
Does it contain every possibility you have hoped for?



You pace back and forth in front of the symbol-marked corridors, reflecting on the journey you've taken to reach this point. Suddenly — like booming thunder or crashing cymbals — it hits you all at once. You know what belongs in each box, and hence which path is the correct one.

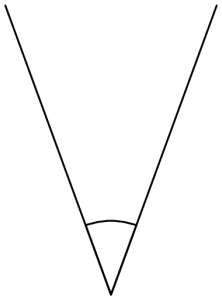
As you squat to write your solution in the centuries-old dust, you glance back at Fiona and Max, who shoot you a puzzled look. You smile and beckon them forward, leading them into the very heart of the lost city of Ozizo.

Meta Solution: ACUTE

Place the mathematical symbols corresponding to the phrases
"THERE EXISTS," "PERPENDICULAR," "INTERSECTION," "SUPERSET," and "FOR ALL" in the boxes. This gives

$$\exists \perp \cap \supset \forall$$

When the paper is rotated 180 degrees, this spells "ACUTE." This means the acute angle (second one from the top left) is the correct path:



The original printout is rotated 180 degrees as a hint to this final step.