Unit 3: Logic and Reasoning

Time Out is related to *Unit 3: Logic and Reasoning*.

Time Outs strengthen numeracy and reasoning skills by using math strategically.

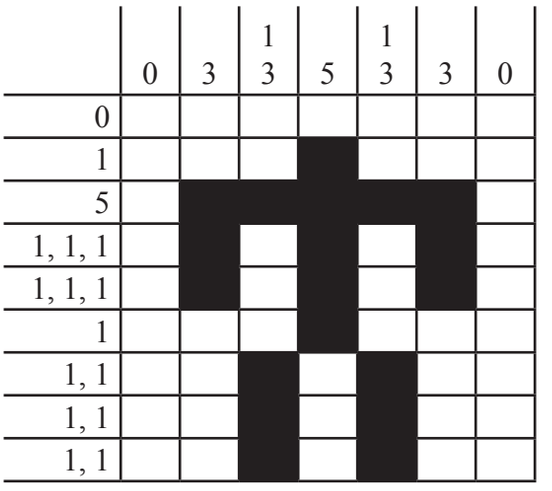
Use strategic thinking to play the game and answer the questions that follow. You will be assessed according to the rubric provided.

Category	Strategy and Procedures	Mathematical Reasoning
	The student...	*The student...*
4	• uses efficient and effective strategies to solve the problem(s) and complete questions	• presents complex and refined mathematical reasoning
3	• uses effective strategies to solve the problem(s) and complete questions	• presents effective mathematical reasoning
2	• uses effective strategies inconsistently to solve the problem(s) and complete questions	• presents some evidence of mathematical reasoning
1	• does not use effective strategies to solve the problem(s) and complete questions	• presents superficial or confusing evidence of mathematical reasoning

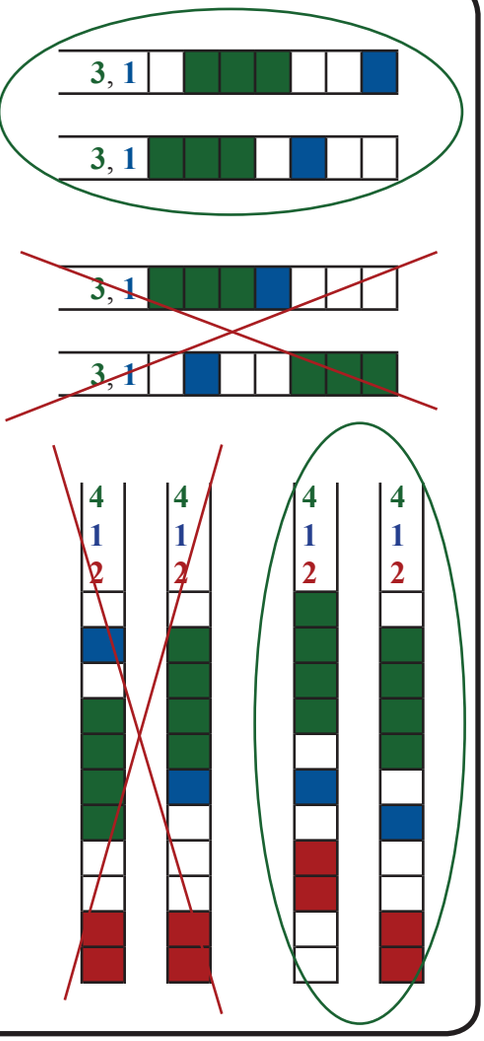
This assessment is worth 8 marks. Take your time.

A nonogram is a type of logic puzzle where the cells of a grid are filled according to numbers on the side and top of the puzzle. The numbers on the side and top indicate the number and size of groups of filled cells in the row or column. Below is a nonogram puzzle and its solution.

	0	3	1 3	5	1 3	3	0
0							
1							
5							
1, 1, 1							
1, 1, 1							
1							
1, 1							
1, 1							
1, 1							



How to read nonogram clues



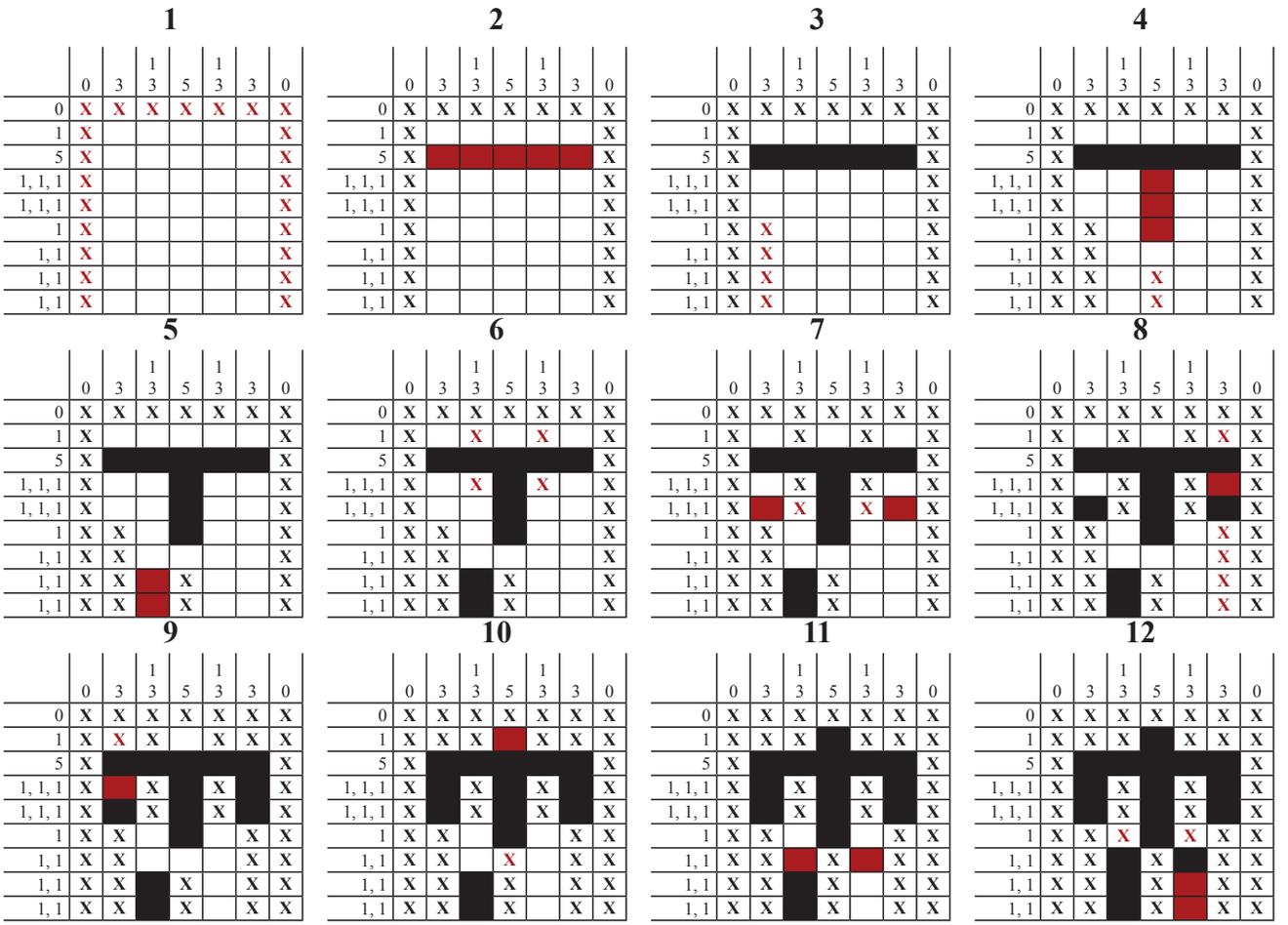
- The clue 3, 1 means there will be a group of 3 cells without a break in it and a group of 1 cell in that row. There will be at least one empty cell between the two. The clue also tells you the group of 3 will be to the left of the group of 1.

- The clue $\begin{matrix}4\\1\\2\end{matrix}$ tells you there will be a group of 4 nearest the top, then a group of 1 and then a group of 2 closest to the bottom.

- The clues do not tell you how far apart the groups will be.

When solving a nonogram it helps to mark cells that cannot be filled as well as cells that must be filled. It is a good idea never to mark a box until you are absolutely sure of its contents.

A student completed the nonogram above. Her steps were as follows.



1. Select five of the student's steps and explain how she was absolutely sure she could put the new red markings in.

2. Attempt at least two of the following puzzles and complete at least one. If you are having difficulty, try using the strategies from the previous example or entering "nonogram strategy" into a search engine.

	1	1	1	1	2 1	2 2 1	7	2 1	1	1	1 1	3 1	9	3 1	1 1	1	1	2 1	7	2 1	1	1
0																						
0																						
2																						
2																						
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0																						
0																						
1																						
3																						
1, 3, 1																						
3, 5, 3																						
3, 1, 3																						
1, 1, 1																						
1, 1, 1																						
1, 1, 1																						
22																						

	1	2	4	6	3	3	4	5	6	7	8	9	10	11	12	2 8	1 1 7	1 1 7	2 2 4	6 4	6 3	5 2	3 2	2 1	1
1, 7																									
2, 3, 4																									
4, 3, 2, 4																									
3, 4, 5																									
2, 7, 7																									
2, 14																									
14																									
16																									
19																									
17																									
14																									
8																									

	2	5 1	9 1 3	5 1 2	11 1 1 3	13 1 1 2 2	2 2 1 1 1 3	14 4	2 26	29	28	29	2 26	14 4	2 2 1 1 1 3	13 1 1 2 2	11 1 1 3	5 1 2	9 1 3	5 1	2
1, 1, 1, 1																					
2, 1, 1, 2																					
2, 2, 1, 1, 2, 2																					
2, 2, 1, 1, 2, 2																					
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5, 3, 5																					
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4, 5, 4																					
3, 5, 3																					
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3. Explain three things you looked for that would allow you to conclude a cell should either be filled or empty.

4. Which type of clue (numbers at the top and left) did you find easiest to use? Which were the hardest? Explain.

You have completed *Unit 3: Time Out*. Please proceed to the *Unit 3: Final Review Assignment*, on the next page of this *Workbook*.