

## Student Guide for POW 13: Shuttling Around

### 1. PROBLEM STATEMENT (6 pts)

#### a. Restate the situation of the POW in your own words

- 0 – No situation stated
- 1 – Situation is copied from text
- 2 – Situation is partially restated and partially copied
- 3 – Situation is restated but lacks some necessary information
- 4 – Situation was written in student's own words and includes all necessary information

#### b. Restate the task in your own words

- 0 – No task stated
- 1 – Task is copied from text or incomplete
- 2 – Task is stated in student's words, and is clear and concise

### 2. PROCESS (22 pts)

#### a. Describe how the original puzzle can be solved

- 0 – No method described
- 1 – Poor overall description that is incomplete and vague and/or does not solve the puzzle
- 2 – A limited description of how to solve the puzzle
- 4 – A complete and thorough description of how to solve the puzzle

#### b. Describe how more than one solution can be found for the original puzzle

- 0 – No process described
- 1 – A vague and incomplete description of an additional methods
- 2 – A complete and thorough description of several additional methods that use a different number of moves

#### c. Prove (If-Then) your lowest value is the minimum number of moves required to solve the original puzzle (extra-credit)

- 0 – No proof provided
- 1 – A poor or incomplete proof
- 2 – A complete proof that clearly proves the lowest value is the minimum

#### d. Describe how other puzzles in the set can be solved

- 0 – No description provided
- 1 – A limited number of puzzles that have poor/incomplete/vague/limited descriptions on how they can be solved
- 2 – A limited number of puzzles that have adequate descriptions of how they can be solved
- 4 – Several puzzles with detailed descriptions of how they can be solved

#### e. Describe how more than one solution can be found for each new puzzle in the set

- 0 – No description stated
- 1 – A limited number of solutions that have poor/incomplete/vague/limited descriptions
- 2 – A limited number of solutions that have adequate descriptions of how they can also solve the new puzzles
- 4 – Solutions with different numbers of moves for each new puzzle with detailed descriptions of how they can be used to solve the new puzzles

- f. **Prove (If-Then) your lowest value is the minimum number of moves required to solve each new puzzle in the puzzle set (extra-credit)**  
 0 – No proof provided  
 1 – Poor or incomplete proofs for a limited number of puzzles  
 2 – Complete proofs that clearly proves the lowest values are the minimums for each new puzzle in the puzzle set
- g. **Provide all diagrams and sketches**  
 0 – No diagrams provided  
 1 – Poor diagrams with little if any labels/explanations/comments  
 2 – Complete diagrams with clear and concise labels/explanations/comments
- h. **Describe any problems you had, and how you solved them**  
 0 – No description of problems encountered  
 1 – Vague and limited discussion of problems encountered  
 2 – Excellent discussion of several problems encountered, including a thorough record or your thought process used to deal with the problems
3. **CONCLUSIONS (6 pts)**
- a. **State the conclusions you reached**  
 0 – No conclusions stated  
 1 – Poor/vague/inappropriate conclusion(s) stated  
 2 – Correct and well-stated conclusion(s) stated
- b. **Prove conclusions or label them as conjectures**  
 0 – No proofs provided  
 1 – Poor/incomplete/inappropriate proofs for conclusions  
 2 – Valid proofs for conclusions and conjectures identified
- c. **State questions you did not have time to investigate**  
 0 – No questions stated  
 1 – Several general questions stated with no specific reason(s) explaining why they would be “important” to investigate  
 2 – Several specific and well-stated questions with valid reasons why they would be “important” to investigate
4. **EVALUATION (8 pts)**
- a. **State the difficulty level of the problem (scale of 1-10), explain**  
 0 - no explanation of level  
 1- minimal explanation of level  
 2 - Complete and thorough explanation of level selected

**b. Identify the best/worst parts of the problem**

- 0 - no identification of best/worst parts of exp
- 1 - minimal listing of best/worst parts of exp
- 2 - Complete and thorough listing of best/worst parts of exp

**c. Write a one paragraph summary of “what you learned from the problem”**

- 0 - No summary paragraph
- 1. A brief, poorly written summary that demonstrates little understanding of the problem, its solution and the mathematical ideas and concepts
- 2. A fair summary that includes some support, but lacks one or two key points that would have demonstrated understanding of the problem, its solution, and the mathematical ideas and concepts
- 3. A good summary that demonstrates an acceptable understanding of the problem, its solution and the mathematical ideas and concepts, however could be described in greater detail
- 4. A well written summary written that demonstrates a thorough understanding of the problem, its solution and the mathematical ideas and concepts

**5. SELF-ASSESSMENT (8 pts)**

**a. Grade and Justify your work using a self-assessment scoring rubric**

- 0 – Work not graded with rubric
- 1 – Score values provide with no justification
- 2 - Score values provide with minimal rationale and many/most values not acceptable based on scoring guide criteria
- 3 - Scores values provided with fair/good rationales, but some values not acceptable based on scoring guide criteria
- 4 - Score values provided with strong rationales, all values acceptable based on scoring guide criteria

**b. Write a one paragraph summary that identifies your weakest areas in this POW and describe the problems you had or the reasons you become “stuck” in these areas**

- 0 – No paragraph written
- 1- A brief, poorly written summary that does not allow the reader the ability to understand why you had problems in specific areas of the POW and could not finish a problem, come to a solution, or make a generalization
- 2. A fair summary that is quite limited, and does not go into detail on problem areas and their specific reasons
- 4. A well written summary written that clearly identifies the weakest areas of the POW and describe the specific reasons that you had problems and how you will try to resolve these problems