

## Student Guide for POW 3: Divisor Counting

### 1. SUBJECT OF EXPLORATION ( 4 pts)

#### a. Describe the subject you are investigating

0 – no description provided

1 – A poor, incomplete description of the subject being investigated

2- A complete well written description of the subject being investigate

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

0 – No task stated

1 – Task is mostly copied from textbook

2- Task is stated in student's words

### 2. QUESTIONS (6 pts)

#### a. State the questions you asked yourself and why you asked them

0 – No questions stated

1 – Question stated with limited explanation of why you asked them

2 – Questions stated with detailed description of why you asked them

4- Questions stated were a combination of original student ideas and questions from text with a detailed description of why you asked them

#### b. State the questions you decided to explore, and why

0 – No questions stated

1 – Questions stated with limited explanation of why you chose to explore them

2 - Questions stated were a combination of original student ideas and questions from text with a detailed description of why you decided to explore them

### 3. INFORMATION GATHERING (8 pts)

#### a. Describe the approaches you tried

0 – No approaches described

1 – A limited number of approaches that are poor, incomplete, or vague in description

2 – An adequate number of approaches are presented in limited descriptions

4 – A complete set of approaches are presented with detailed descriptions

#### b. Describe the information you gathered

0 – No description given

1 – Poor, incomplete, or vague description of information gathered with no specific examples cited

2 – A detailed description of information gathered with many specific examples cited

#### c. Describe when you decided to stop trying different approaches, and why

0 – No description provided

1 – A limited, incomplete, or vague description with no supporting examples

2 – A detailed description with many specific supporting examples

**4. RESULTS AND CONJECTURES (14 pts)**

**a. State conjectures you found as possible answers**

0 – No conjectures given

1 – Conjectures are given, but they are poorly stated or inappropriate

2 – Conjectures are well-stated and appropriate

**b. Prove your conjectures are correct**

0 – No proof given

1 – Proofs are vague, do not make sense, or based on incorrect assumptions and mathematical concepts/ideas

2 – Proofs are correct, but not thorough or minor steps are missing

4 – Proofs are logical and sequential (step by step) and all necessary steps are described in detail

**c. State the rules and patterns found in exploring your questions**

0 – No rules or patterns stated

1 – Rules or patterns are vague, do not make sense, or based on incorrect assumptions and mathematical concepts/ideas

2 – Rules and patterns are correctly stated for some of your explorations, but not all possible rules and patterns are stated for your explorations

4 – Rules and patterns are correctly stated for possibilities in your explorations

**d. Describe why a rule or pattern works**

0 – No description given

1 – A limited or poor/incomplete/vague description with no supporting material

2 – A detailed description with extensive supporting material provided

**e. Write a generalization of your results**

0 – No generalization given

1 – A limited or poor/incomplete/vague generalization with no supporting material

2 – A detailed description of a generalization with extensive supporting material

**5. EVALUATION ( 10 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. Describe your personal reaction/opinion to the problem**

0 - no opinion or reaction stated

1 - a minimal statement with little support

2 - a well discussed statement of opinion/reaction

**c. 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

**d. 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

**6. 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