MTH-2010, FALL 2014
DR. GRAHAM-SQUIRE

MTEL OPEN-ENDED QUESTION PROMPT - SHADED FRACTION

1. Directions

This section of the test consists of an open-response item assignment that appears on the following page. You will be asked to prepare a written response of approximately 1-2 pages for the assignment. You should use your time to plan, write, review, and edit your response for the assignment.

Read the topic and directions for the assignment carefully before you begin to work. Think about how you will organize your response.

As a whole, your response to the assignment must demonstrate an understanding of the knowledge of the field. In your response to the assignment, you are expected to demonstrate the depth of your understanding of the subject area by applying your knowledge rather than by merely reciting factual information.

Your response to the assignment will be evaluated based on the following criteria.

- PURPOSE: the extent to which the response achieves the purpose of the assignment
- SUBJECT KNOWLEDGE: appropriateness and accuracy in the application of subject knowledge
- SUPPORT: quality and relevance of supporting evidence
- RATIONALE: soundness of argument and degree of understanding of the subject area

The open-response item assignment is intended to assess subject knowledge. Your response must be communicated clearly enough to permit valid judgment of the evaluation criteria by scorers. Your response should be written for an audience of educators in this field. The final version of your response should conform to the conventions of edited American English. Your response should be your original work, written in your own words, and not copied or paraphrased from other work.

Be sure to write about the assigned topic. Please write legibly. You may not use any reference materials during the test. Remember to review your work and make any changes you think will improve your response.

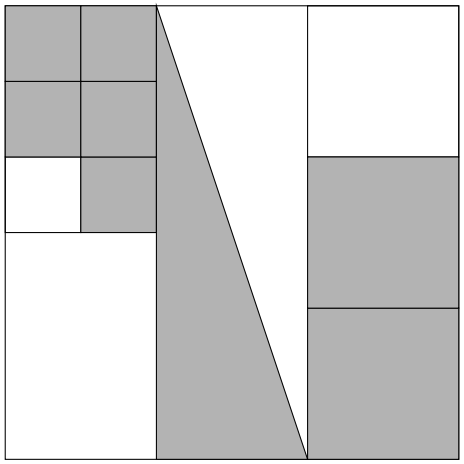
You can either hand-write your response or (better) type up your response and email it to me at

`agrahams@highpoint.edu`

2. Assignment

Students are asked to solve the following problem:

For the figure below, calculate the total fraction of the figure that is shaded. Write your answer in lowest terms.



Student response: "The figure is broken up into thirds. In the left third, there are 5 out of 6 blocks shaded. In the middle third one-half of the diagram is shaded. In the right third, two-thirds of the diagram is shaded. So I calculate:

$$\frac{1}{3} + \left(\frac{5}{6} + \frac{1}{2} + \frac{2}{3}\right) = \frac{1}{3} + \frac{8}{11} = \frac{9}{14} = \frac{\cancel{9}^{3}}{\cancel{14}_{7}} = \frac{3}{7}$$

Thus the total fraction of the figure that is shaded is $\frac{3}{7}$."

Use your knowledge of mathematics to create a response in which you analyze the student's work and provide an alternative solution to the problem. In your response, you should:

- correct any errors or misconceptions evident in the student's work and explain why the response is not mathematically sound (be sure to provide a correct solution, show your work, and explain your reasoning); and
- solve the problem using an alternative method that could enhance the student's conceptual understanding of fraction calculations in the context of the problem.

Be sure to cite specific evidence from the information shown to support your response.