



The Pennsylvania System of School Assessment



2005 – 2006
Mathematics Item and Scoring Sampler
Grade 5

Pennsylvania Department of Education Bureau of Assessment and Accountability 2005–2006

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MATHEMATICS ITEM AND SCORING SAMPLER

General Introduction

The Department of Education provides districts and schools with tools to assist in delivering focused instructional programs aligned to the state assessment system. These tools include assessment anchor documents, assessment handbooks, and content-based item and scoring samplers. This 2005–2006 Mathematics Item and Scoring Sampler is a useful tool for Pennsylvania educators in the preparation of local instructional programs and the statewide PSSA assessments.

What's Included

This item and scoring sampler contains multiple-choice items and open-ended items from the Spring 2005 PSSA. These released operational items are actual examples of those used to assess student performance on the PSSA. These provide an idea of the types of items that will appear on the operational Spring 2006 PSSA. Each item has been through a rigorous review process and is aligned to the Assessment Anchors and State Standards.

Purpose and Uses

The items in this sampler may be used as examples for creating assessment items at the classroom level, and they may also be copied and used as part of a local instructional program. Classroom teachers may find it beneficial to have students respond to the open-ended items in the sampler. Educators can then use the sampler as a guide to score the responses either independently or together with colleagues within a school or district.

Item Format and Scoring Guidelines

The multiple-choice items have four answer choices. A correct response to each multiple-choice item is worth 1 point.

The open-ended items are each designed to take about ten minutes to complete, although, during an actual testing event, students are given additional time as necessary to complete the test items. The open-ended items in mathematics are scored with item-specific scoring guidelines on a 0–4 scale. The item-specific scoring guidelines presented within this sampler were used to score each respective open-ended item as it appeared on the Spring 2005 PSSA. Actual (transcribed) student responses are used as samples to represent each score point.

Also included is the General Description of Scoring Guidelines for Mathematics used to develop the item-specific guidelines. The General Description of Scoring Guidelines should be used to develop any item-specific scoring guidelines created for use within local instructional programs.*

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DESCRIPTION OF SCORING GUIDELINES FOR OPEN-ENDED ITEMS

General Description of Mathematics Scoring Guidelines:

- 4 – The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.**

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor “blemish” (e.g., missing \$) or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

- 3 – The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.**

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

- 2 – The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.**

The response is somewhat correct with a *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

- 1 – The response demonstrates a *minimal* understanding of the mathematical concepts and procedures as required by the task.**

- 0 – The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task for that grade level.**

Response may show only information copied from the question.

Special Categories within zero reported separately:

BLK – Blank, entirely erased, or written refusal to respond

OT – Off task

IL – Illegible

LOE – Response in a language other than English

MATHEMATICS REPORTING CATEGORIES

Mathematics scores are reported in five categories:

- A** – Numbers and Operations
- B** – Measurement
- C** – Geometry
- D** – Algebraic Concepts
- E** – Data Analysis and Probability

Twenty-five multiple-choice items are shown in this booklet; all categories are represented.

SAMPLE ITEMS

The Mathematics multiple-choice items begin on the next page. Each item is preceded by the Assessment Anchor and Eligible Content coding. The majority of answer options A-D are followed by a brief analysis or rationale. The correct answer is indicated by an asterisk (*).

Two open-ended items follow the multiple-choice items. Each of these is displayed with an item-specific scoring guideline and response examples with scores and annotations.

A calculator and scratch paper are permitted for use in solving all of the presented items.

MATHEMATICS

A.1.1.1

1. Which is equal to 253.4?

- A $2000 + 50 + 3 + 0.4$
- B $2000 + 500 + 30 + 4$
- C $200 + 50 + 3 + 0.4$ *
- D $200 + 500 + 30 + 4$

A.1.2.1

2. Which number is sixty-two and fifty-four hundredths?

- A 62.0054
- B 62.054
- C 62.504
- D 62.54 *

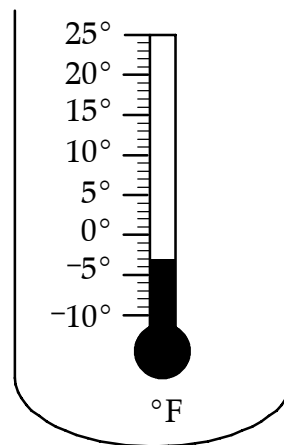
A.1.2.2

3. What digit is in the hundredths place in the number 2.143?

- A 2
- B 1
- C 4 *
- D 3

A.1.4.2

Use the thermometer below to answer question 4.



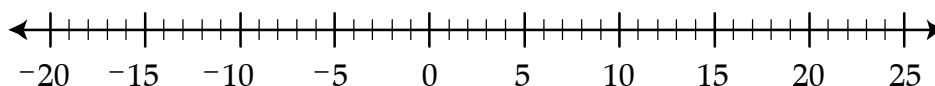
4. What is the temperature reading on the thermometer?

- A -7°F
- B -5°F
- C -3°F *
- D 3°F

MATHEMATICS

A.1.4.1

5. Daniel counted backwards by fives from 20 to -5.

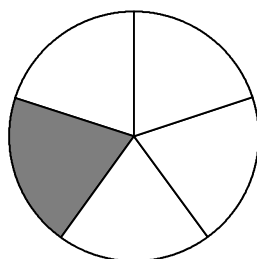


He continues counting backwards by fives. What number should Daniel count next?

- A -15
- B -10 *
- C 0
- D 25

A.1.5.1

Use the figure below to answer question 6.



6. What fraction of the circle is shaded?

- A $\frac{1}{5}$ *
- B $\frac{1}{4}$
- C $\frac{4}{5}$
- D $\frac{5}{1}$

A.1.6.1

Use the list of numbers below to answer question 7.

2, 5, 7, 13, 17

7. Which describes every number in the list?

- A prime *
- B composite
- C factor of 34
- D multiple of 2

MATHEMATICS

A.1.6.2

8. A box of chalk has 16 pieces. Which list shows the total number of pieces of chalk in 1 box, 2 boxes, 3 boxes, and 4 boxes?

- A 16, 18, 19, 20 $16 + 2; 16 + 3; 16 + 4$
 B 16, 20, 24, 28 *adds 4 to each term*
 C 16, 32, 48, 64 *
 D 16, 32, 64, 128 *doubles each term*

A.1.6.2

9. Which list shows **all** the factors of 32?

- A 1, 2, 4, 6, 32 *missing 2 factors;
 $3 \times 2 = 6$*
 B 1, 3, 4, 8, 32 *missing 2 factors;
3, digit in 32*
 C 1, 2, 4, 8, 16, 32 *
 D 1, 3, 4, 8, 16, 32 *missing 1 factor;
3, digit in 32*

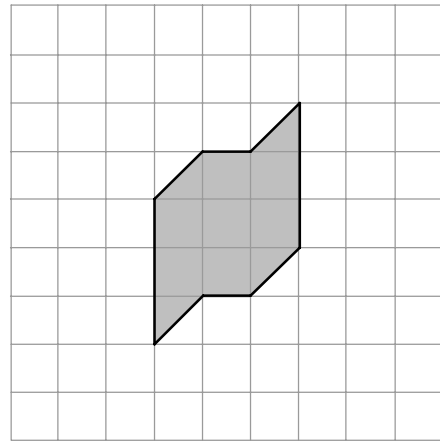
A.2.1.3

10. Sam spent \$28 on groceries. His uncle will pay him half of the cost of the groceries. Which operation should Sam use to figure out how much money his uncle should pay him?

- A add 2 to 28
 B subtract 2 from 28
 C multiply 28 by 2
 D divide 28 by 2 *

B.1.3.2

Use the figure below to answer question 11.



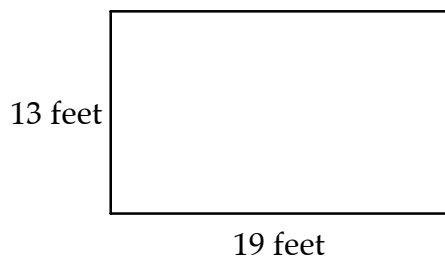
11. What is the area of the shaded figure?

- A 9 square units *
 B 11 square units *half units as whole*
 C 12 square units *3 by 4 units*
 D 15 square units *3 by 5 units*

MATHEMATICS

B.2.2.1

Use the rectangle below to answer question 12.



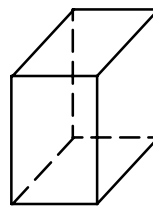
12. What is the area of the rectangle?

- A 32 square feet $19 + 13$
- B 64 square feet $2(19 + 13)$
- C 227 square feet $1 + 1 ; 3 \times 9$
- D 247 square feet *

C.1.1.1

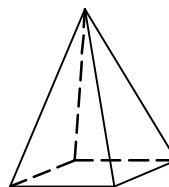
13. Which figure has the fewest number of vertices?

A



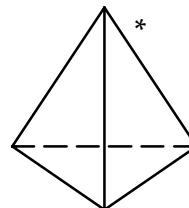
8 vertices

B

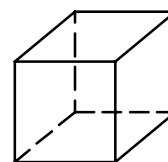


5 vertices

C



D

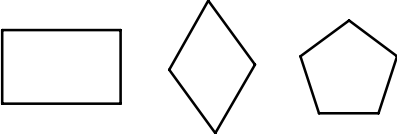
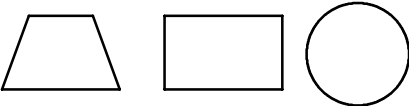
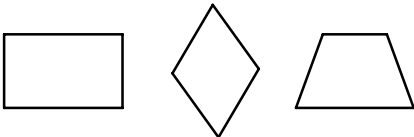


8 vertices

MATHEMATICS

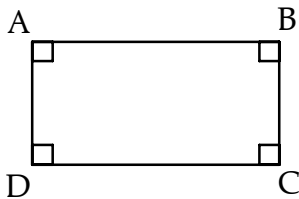
C.1.1.2

14. Which group of figures contains **only** quadrilaterals?

- A 
 triangle – 3 sides
- B 
 pentagon – 5 sides
- C 
 circle – curved line
- D  *

C.1.1.2

Use rectangle ABCD below to answer question 15.



15. Which statement is **not** true about sides $\overline{AB}$ and $\overline{DC}$?

- A They are parallel.
- B They are perpendicular. *
- C They are line segments.
- D They are the same length.

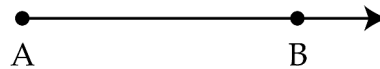
C.1.1.3

16. Which correctly describes the three angles in a right triangle?

- A 1 right angle and 2 acute angles *
- B 1 right angle and 2 obtuse angles $sum > 180^\circ$
- C 1 right angle, 1 acute angle, and 1 obtuse angle $sum > 180^\circ$
- D 3 right angles $270^\circ > 180^\circ$

C.1.2.1

Use the figure below to answer question 17.



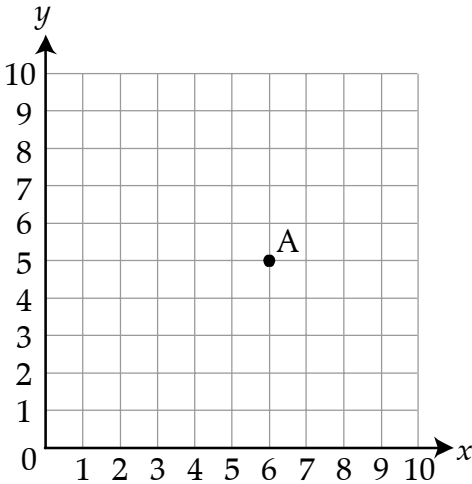
17. What is the name of the figure?

- A ray *
- B line
- C plane
- D point

MATHEMATICS

C.3.1.1

18. Point A is shown on the coordinate grid below.



Which ordered pair names the location of point A?

- A (5, 5) *x-axis error*
- B (5, 6) *coordinates reversed*
- C (6, 5) *
- D (6, 6) *y-axis error*

D.1.1.1

19. A pattern of numbers is shown below.

2, 3, 5, 8, 12, 17, ____

The pattern continues. What will be the next number?

- A 22 $17 - 12; 17 + 5$
- B 23 *
- C 29 $17 + 12$
- D 33 $17 \times 2 - 1; \text{based on } 2, 3, 5$

D.1.1.1

20. The table below shows the temperature at noon each day for seven days.

Temperatures

Day	Temperature (F°)
Sunday	62°
Monday	58°
Tuesday	60°
Wednesday	56°
Thursday	58°
Friday	54°
Saturday	56°
Sunday	?

The pattern in the temperatures continues. What will be the temperature on Sunday?

- A 60° $+ 4$
- B 58° $+ 2$
- C 54° $- 2$
- D 52° *

MATHEMATICS

D.2.1.3

21. The length of a rope (r) is less than 15 feet. Which number sentence describes the length of the rope?

A $r < 15$ *

B $r > 15$ *r greater than 15*

C $r - 15$ *difference*

D $r + 15$ *sum*

E.2.1.2

22. The chart below shows the ages of the guests at Kim's birthday party.

Ages of Kim's Guests

Name of Guest	Age
Damon	8
Angie	9
Thuy	8
Mike	9
Joey	11
Abdullah	11
Gavin	10
Gretchen	13
Carlos	10
Regina	11

What is the **mode** of the ages of Kim's guests?

A 8 *youngest*

B 10 *median*

C 11 *

D 13 *oldest*

MATHEMATICS

E.3.1.2

23. A cube is numbered 1 through 6 on its faces. Sheila rolled the cube. What is the probability she rolled an even number?

A $\frac{1}{6}$

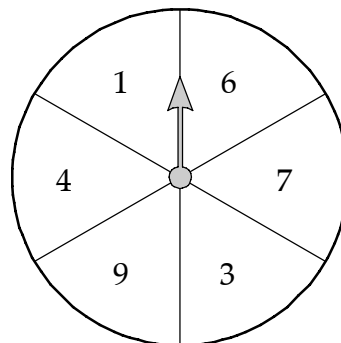
B $\frac{1}{3}$

C $\frac{3}{6}$ *

D $\frac{3}{3}$

E.3.1.2

Use the spinner below to answer question 24.



24. Durell spins the spinner above. What is the probability it will land on an even number?

A $\frac{2}{6}$ *

B $\frac{2}{4}$

C $\frac{4}{6}$

D $\frac{6}{2}$

MATHEMATICS

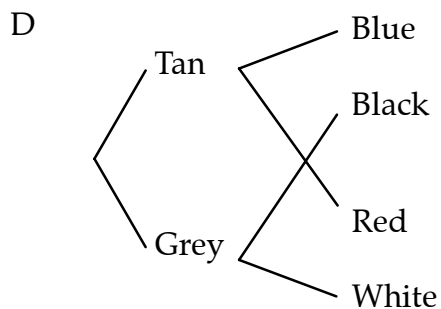
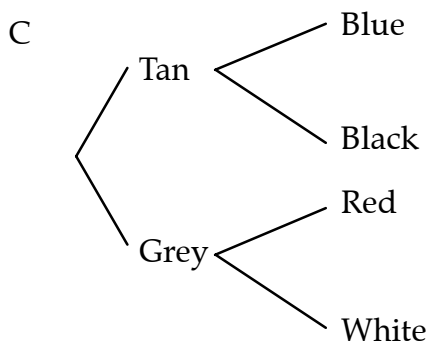
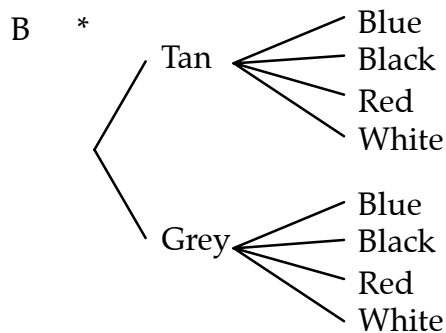
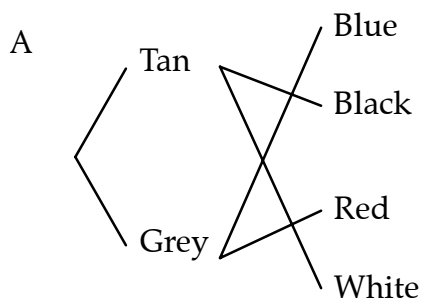
E.3.1.3

25. The color choices for the car Natalya wants to buy are shown below.

Interior color: tan, grey

Exterior color: blue, black, red, white

Which tree diagram shows **all** of the different combinations of an interior color and an exterior color?



GRADE 5 OPEN-ENDED ITEMS BEGIN ON THE NEXT PAGE

MATHEMATICS

A.2

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to the previous page for task explanation.

- B.** James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

MATHEMATICS

Item # 26

This item will be reported under Category A, Numbers and Operations.

Assessment Anchor:

A.2-Understand the meanings of operations, use operations, and understand how they relate to each other.

Specific Eligible Content addressed by this item:

A.2.1.1-Solve problems involving addition, subtraction, multiplication, and division of whole numbers.

A.2.1.3-Choose the correct operation to solve a problem.

Scoring Guide:

Score	In response to this item, the student—
4	demonstrates a thorough understanding of the meanings and correct usage of operations and their relation to each other by solving problems involving addition, subtraction, multiplication, and division of whole numbers. (Response may contain a minor blemish that does not detract from demonstrating a thorough understanding.)
3	demonstrates a general understanding of the meanings and correct usage of operations and their relation to each other by solving problems involving addition, subtraction, multiplication, and division of whole numbers with only minor errors or omissions.
2	demonstrates a partial understanding of the meanings and correct usage of operations and their relation to each other by correctly performing a significant portion of the task.
1	demonstrates a minimal understanding of the meanings and correct usage of operations and their relation to each other.
0	has given no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task for this grade level. (The response may show only information copied from the question.) BLK-Blank, entirely erased, or written refusal to respond OT-Off task IL-Illegible LOE-Response in a language other than English

MATHEMATICS

Item #26

Top Scoring Response:

Part A Answer	Work/Explanation
\$34.00	$5 \times \$6 = \30 $1 \times \$4 = \4 $\$30 + \$4 = \$34$ OR I multiplied the amount of money James was paid to walk one dog by the number of dogs James walked. Five times 6 dollars equals 30 dollars. I also multiplied the amount of money James was paid to paint for one hour by the number of hours he painted. One times 4 dollars equals 4 dollars. Then I added the two amounts ($\$30 + \4) and got a total of 34 dollars.

(1.5 score points)

1.5 points for correct answer with correct work or with clear and complete explanation

Part B Answer and Work	Explanation
Walk 8 dogs and paint for 3 hours $8 \times \$6 = \48 $3 \times \$4 = \12 $\$48 + \$12 = \$60$ OR other correct combination with work shown	I multiplied numbers of dogs by 6 until I got close to 60. I subtracted the amount from 60 each time and I looked at the difference to see if it was divisible by 4. When I subtracted 48 from 60, the 12 was divisible by 4, so James could paint for 3 hours and make 12 dollars. I could add \$12 to \$48 and get \$60.

(2.5 score points)

1 point for correct answer

1.5 points for all work shown and a clear and complete explanation

MATHEMATICS

A.2 Response Score: 4

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

Remember
Earns \$6 each dog he walks
Earns \$4 each house he paints. ←

$$\begin{array}{r} 6 (\$) \\ \times 5 (\text{dogs}) \\ \hline 30 \end{array} \quad \begin{array}{r} 1 (\text{hour}) \\ \times 4 (\$ \text{Houses}) \\ \hline 4 \end{array}$$

$$\begin{array}{r} 30 \\ + 4 \\ \hline \$ 34 \end{array}$$

He should have earned \$34.00 altogether.

The student has given the correct answer and has shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

$$\begin{array}{r} \textcircled{1} \quad 6 \$ \\ \times 6 \leftarrow \text{dogs} \\ \hline 36 \Rightarrow \$36.00 \end{array}$$

$$\begin{array}{r} \textcircled{3} \quad 6 \text{ House} \\ \times 4 \$ \\ \hline \$24.00 \end{array}$$

$$\begin{array}{r} \textcircled{2} \quad \overset{5}{\cancel{6}}\overset{10}{0} \\ - 36 \\ \hline \$24 \end{array}$$

$$\begin{array}{r} \textcircled{4} \quad \$36.00 \\ + \$24.00 \\ \hline \underline{\$60.00} \end{array}$$

Answer:

6 Dogs
6 Houses

Explanation: $\textcircled{1}$ First I multiplied 6×6 because I started off with that and got $36 \Rightarrow \$36.00$.

$\textcircled{2}$ Then I subtracted 36 from 60 because I needed to see how much more money we needed and I got $24 \Rightarrow \$24.00$.

$\textcircled{3}$ Then I figured out what times what equals 24? $6 \times 4 = \$24.00$

$\textcircled{4}$ And then I added $\$36.00 + \24.00 and got $\$60.00$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \text{ Dogs} \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \text{ Houses} \end{array}$$

The student has given a correct answer; the label "houses" (Part B) instead of "hours" is considered a minor blemish. All work is shown and the explanation is clear and complete.

MATHEMATICS

A.2 Response Score: 3

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

I first read the problem, it said he walked 5 dogs and \$6 is for every dog he walked. So I multiplied 6×5 and got 30, And then I looked back at the problem and said he painted a house for 1 hour so I knew he got \$4 for a house he paints for an hour, so I added 4 and came up with \$34. That's how I got the answer.

$$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \\ + 4 \\ \hline \$34 \end{array}$$

The student has given the correct answer, shown all work, and provided an explanation.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

I first read the problem and then I knew that $6 + 4 = 10$ and I also knew that $10 \times 6 = 60$ so I multiplied 6×6 and got 36. Next I multiplied 4×6 and came up with 24 so I added 36 and 24 and came up with 60, so that is how I came up with the answer.

$$\begin{array}{r} 6 + 4 = 10 \\ 6 + 4 = 10 \\ 6 + 4 = 10 \\ 6 + 4 = 10 \\ 6 + 4 = 10 \\ \hline 6 + 4 = 10 \\ \hline 36 + 24 = 60 \end{array}$$

The student has shown all work and provided a clear explanation. There is no answer given.

MATHEMATICS

A.2 Response Score: 3

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

first $5 \times 6 = 30$ then
 $30 + 4 = 34$

$$\begin{array}{r} 5 \\ \times 6 \\ \hline \$ 30 \\ + 4 \\ \hline 34 \end{array}$$

\$34

The student has given the correct answer and shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

I used guess and check, and I got 9 house he had to paint and 4 dogs he had to walk.

The student has given a correct answer. The use of "house" instead of "hours" is considered a minor blemish. The work shown lacks clarity and the explanation is incomplete.

$$\begin{array}{r}
 9 - 36 \\
 4 - 24 \\
 \hline
 60
 \end{array}$$

$$\begin{array}{r}
 9 - 28 \\
 4 - 24 \\
 \hline
 52
 \end{array}$$

$$\begin{array}{r}
 7 - 28 \\
 5 - 30 \\
 \hline
 58
 \end{array}$$

$9 \times 20 = 180$
 $4 \times 15 = 60$
 $180 + 60 = 240$

MATHEMATICS

A.2 Response Score: 2

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

$$\begin{array}{r} 5 \text{ dogs} \\ \times 6 \\ \hline \$30 \end{array}$$
$$\begin{array}{r} \$6 \text{ per dog} \\ \$4 \text{ per hrs painting house} \\ \times 1 \\ \hline \$4 \end{array}$$

$\$34$ ALL TOGETHER

The student has given the correct answer and has shown adequate work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

6 per dog

$$\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array} \quad \begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array}$$

↓

\$60 EXACT

The student has shown a correct procedure but has made an error in multiplication. The answer is not stated and no explanation has been given.

MATHEMATICS

A.2 Response Score: 2

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

WORK	EXPLAIN
$5 \times 1 = 5$ $\begin{array}{r} 30 \\ + 4 \\ \hline 34 \end{array}$ $6 \times 5 = 30 + 4 = 34$ $\begin{array}{r} 6 \\ + 6 \\ + 6 \\ + 6 \\ + 6 \\ + 4 \\ \hline 34 \end{array}$	① I MULTIPLY THE NUMBER OF DAY HE WALK AND THE NUMBER OF HOUSE I ADD UP HOW MUCH MONEY CAUSE FOR DOG AND TO PAINT A HOUSE. BUT I WOULD TIMES HOW MUCH HE WALK THE DOG FOR AND PAINT FOR BUT DIDNT WORK THEREFORE I ② HAD TO ADD THE OF TIME WALK THE DOG AND PAINT AND I CAME WITH A ANSWER. ③ (34)

The student has given the correct answer and shown all work. The "run-on" equation does not detract from demonstrating an understanding of this task.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

WORK	EXPLAIN
$ \begin{array}{r} 6 > 12 \\ 6 / 18 \\ 4 < 22 \\ 4 < 28 \\ 6 < 28 \\ 36 \\ 24 \\ \hline \$60 \end{array} $	① I WILL ADD UP ALL THE MANY OF HOURS OF THE PAINTING JOB AND SOME OFF THE WALKING JOB. ② I WILL ADD SOME OF THEM UP AND GET A FEW NUMBER AND GET A NUMBER. ③ $ \begin{array}{r} 36 \\ + 24 \\ \hline 60 \end{array} $

The student has shown some correct procedure. The answer is not given. The explanation is insufficient.

MATHEMATICS

A.2 Response Score: 1

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

$$5 \text{ dogs} + 1 \text{ house} = \$34$$

$$\$34$$

The student has given the correct answer.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

He will have to walk 5
dogs and paint 5 hrs.
By thinking good.

The student has given an incorrect answer. No work is shown.

MATHEMATICS

A.2 Response Score: 1

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

Work	explain
$5 \times 4 = 120$ ✓ each dog = 4 dog	James walk five dogs and six dollars for each dog. So five $\times$ six = 30. $30 \times 4 = 120$

The student has shown a partially correct procedure. The answer is incorrect.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

work	explain
$10 \times 6 = 60$ 10 dogs 6 dollars for each dog.	James need to walk 10 dogs And $10 \times 6 = 60$ And one hour of painting would give him 61 dollars.

The student has shown some correct procedure. The answer "61 dollars" is incorrect. The explanation is incorrect.

MATHEMATICS

A.2 Response Score: 0

26. To earn money for summer camp, James walks dogs and helps paint houses. He earns \$6 for each dog he walks and \$4 for each hour he helps paint houses.

- A. During one week, James walked 5 dogs and helped paint a house for 1 hour. How much money should James have earned? Show or explain your work.

$$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$$

because he had one week and 5 dogs and one our so I timesed the 1 and 1 and turned it into a 2 and timesed it by 5 and I got 10.

The student's response is incorrect.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

26. *Continued.* Please refer to previous page for task explanation.

- B. James needs to earn \$60 for his trip to summer camp. Determine a combination of the number of dogs James needs to walk and the number of hours he needs to paint to earn **exactly** \$60. Show all your work and explain why you did each step.

$$\begin{array}{r} 60 \\ \times 60 \\ \hline 00 \\ - 3600 \\ \hline 36,00 \end{array}$$

*I timesed 60 times 60
and then I got 36,00.*

The student has given no correct answer or evidence demonstrating any understanding of the concepts and procedures required by the task.

MATHEMATICS

B.2

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B.** Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

MATHEMATICS

Item #27

This item will be reported under Category B, Measurement.

Assessment Anchor:

B.2-Apply appropriate techniques, tools, and formulas to determine measurements.

Specific Content addressed by this item:

B.2.2-Solve problems involving length, time, weight, mass, capacity, temperature, perimeter, area and/or money.

B.2.2.1-Find the perimeter or area of a square or rectangle (same system of measurement-whole numbers only).

Scoring Guide:

Score	In response to this item, the student—
4	demonstrates a thorough understanding of solving problems involving the area of a rectangle by applying appropriate techniques and formulas to determine measurements.
3	demonstrates a general understanding of solving problems involving the area of a rectangle by applying appropriate techniques and formulas to determine measurements with only minor errors or omissions.
2	demonstrates a partial understanding of solving problems involving the area of a rectangle by performing a significant portion of the task.
1	demonstrates a minimal understanding of solving problems involving the area of a rectangle.
0	has given no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task for this grade level. (The response may show only information copied from the question.) BLK-Blank, entirely erased, or written refusal to respond OT-Off task IL-Illegible LOE-Response in a language other than English

MATHEMATICS

Item #27

Top Scoring Response:

Part A Answer	Work
24 blocks	$\text{Area} = \text{length} \times \text{width}$ $A = 6 \times 4$ $A = 24 \text{ square feet}$

(1.5 score points)

1.5 points for correct answer with all work shown

Part B Answers	Explanation
Length 3 feet and width 8 feet AND Length 12 feet and width 2 feet OR Other length and width measurements producing an area of 24 square feet	Mr. Garcia could only use 24 blocks which is an area of 24 square feet. His patio could not be 6 feet by 4 feet, so I had to think of 2 other sets of measurements that I could multiply together and get a product of 24. I thought of $3 \times 8 = 24$ and $12 \times 2 = 24$.

(2.5 score points)

2.5 points for 2 sets of correct dimensions with a clear and complete explanation

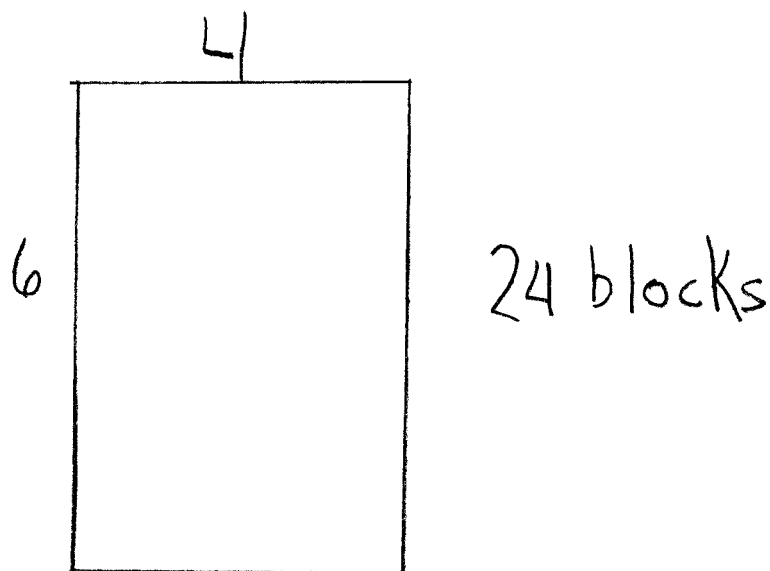
MATHEMATICS

B.2 Response Score: 4

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

Mrs. Jones's patio



$$6 \times 4 = 24$$

The student has given the correct answer and has shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

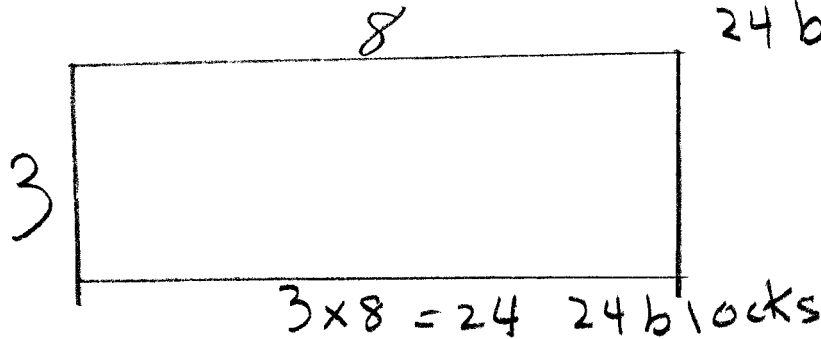
MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

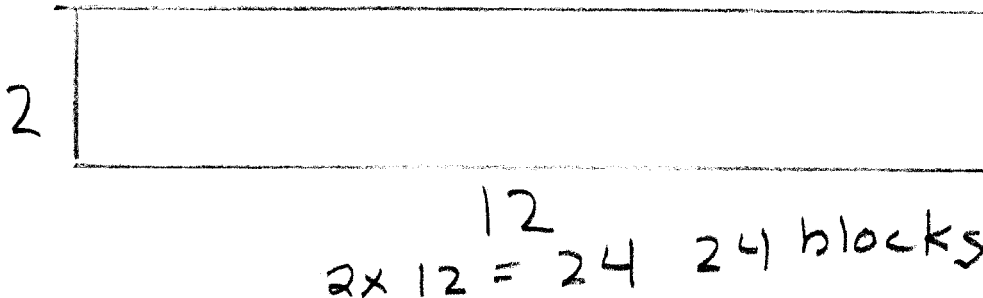
- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

I did 3×8 because I know
 $3 \times 8 = 24$ and Mr. Garcia
wants to use

24 block



I did 2×12 because I know $2 \times 12 = 24$



The student has given 2 sets of correct dimensions and a clear and complete explanation.

MATHEMATICS

B.2 Response Score: 3

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

key 1 foot = 1 inch

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

$$6 \times 4 = 24$$

The student has given a correct answer and has shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

Key 1 foot = 1 cent.

 $8 \times 3 = 24 \text{ feet}$

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24

$$12 \times 2 = 24 \text{ feet}$$

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

The student has given 2 sets of correct dimensions and has provided a clear explanation through the use of diagrams. There is a minor error in units ("feet" instead of "square feet").

MATHEMATICS

B.2 Response Score: 3

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$

6 long
4 wide

she will need 24 blocks
to fill the space

The student has given the correct answer and has shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

$$\begin{array}{r} \times 8 \\ 3 \\ \hline 24 \end{array} \quad \begin{array}{r} 12 \\ \times 2 \\ \hline 24 \end{array}$$

He will use
the same number
of blocks because the
fractions equal the
same number.

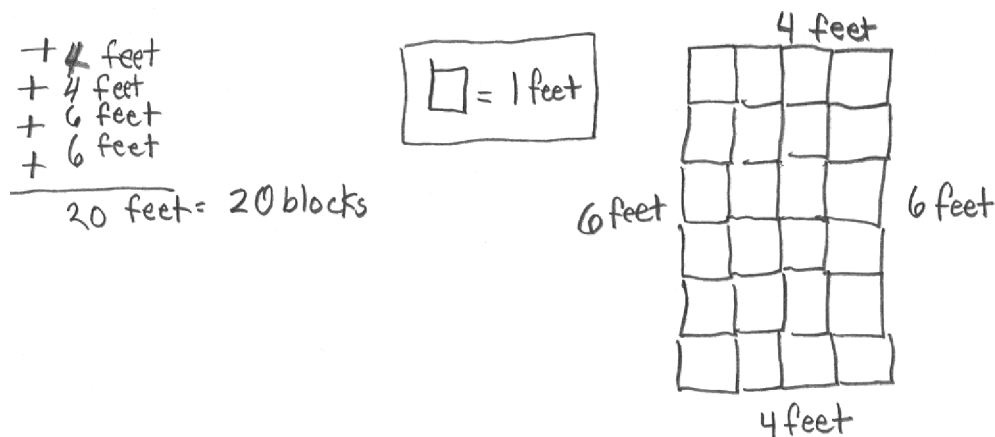
The student has given 2 sets of correct dimensions. There is a minor error in the explanation ("fractions" instead of "products" or "areas").

MATHEMATICS

B.2 Response Score: 2

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.



The student has given an incorrect answer (perimeter). The unit (feet) in the key is incorrect.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

8 feet long and 3 feet wide,
12 feet long and 2 feet wide.

First I tried to times 8 times 3 and it came out to be 24, And then I knew it was 24 because on the other page 6 times 4 equals 24, Second I times 12 times 2 and it came out to be 24 and I did the same thing looked on the other page and times 6 times 4 and it came out to be 24 that how I got my 2 answers.

The student has given 2 sets of correct dimensions and a clear explanation for each.

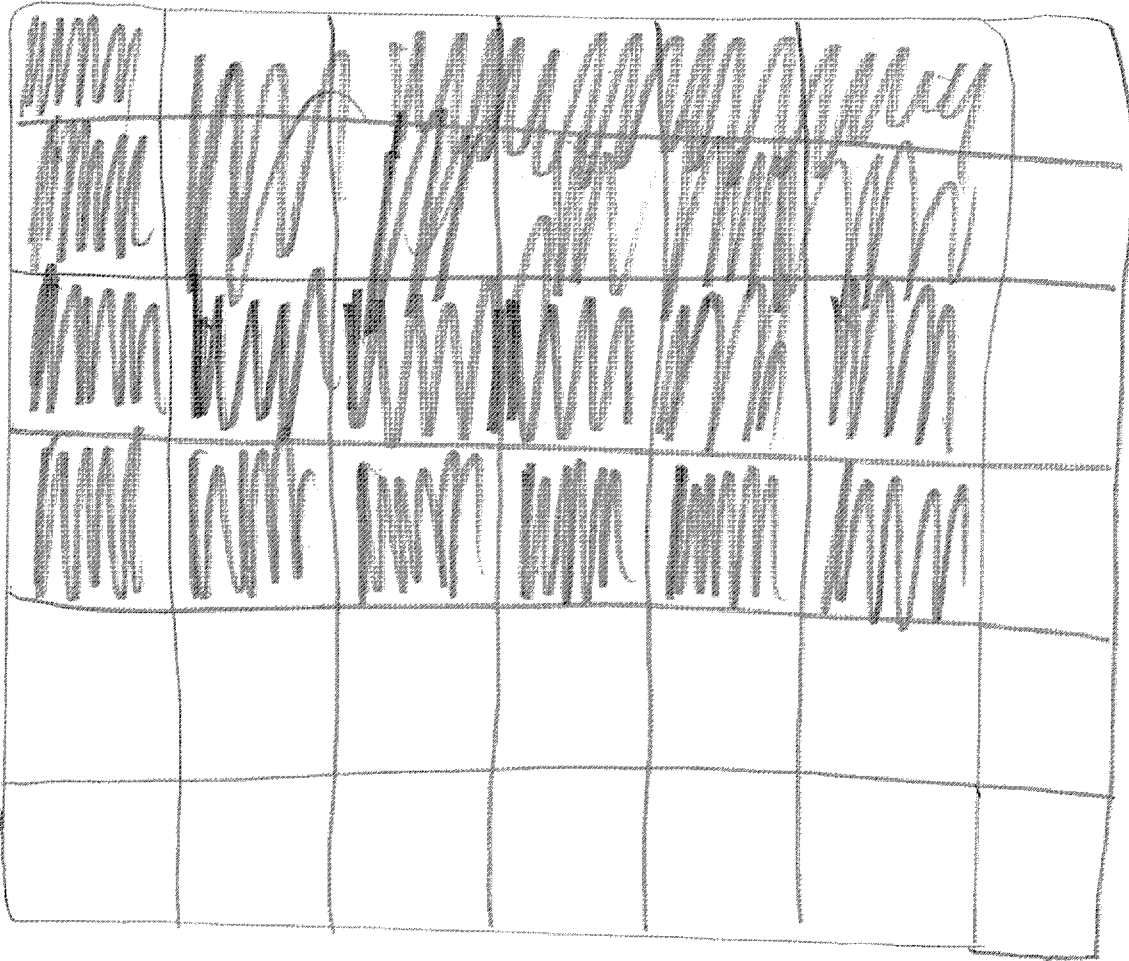
MATHEMATICS

B.2 Response Score: 2

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

24 blocks



The student has given the correct answer and shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

~~8 ft~~ for the length
and
3 ft width

or

6 ft for the length
and
4 ft for the width

I know this because Mrs. Jones
used 24 blocks and so you
 $8 \times 3 = 24$ or $6 \times 4 = 24$

The student has given 1 correct set of dimensions with an explanation and 1 incorrect (repeated) set.

MATHEMATICS

B.2 Response Score: 1

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$

She needs 24 blocks
to cover the whole
Deck.

1	5	9	13	17	21
2	6	10	14	18	22
3	7	11	15	19	23
4	8	12	16	20	24

The student has given the correct answer and shown all work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B.** Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

6 feet wide 4 feet wide

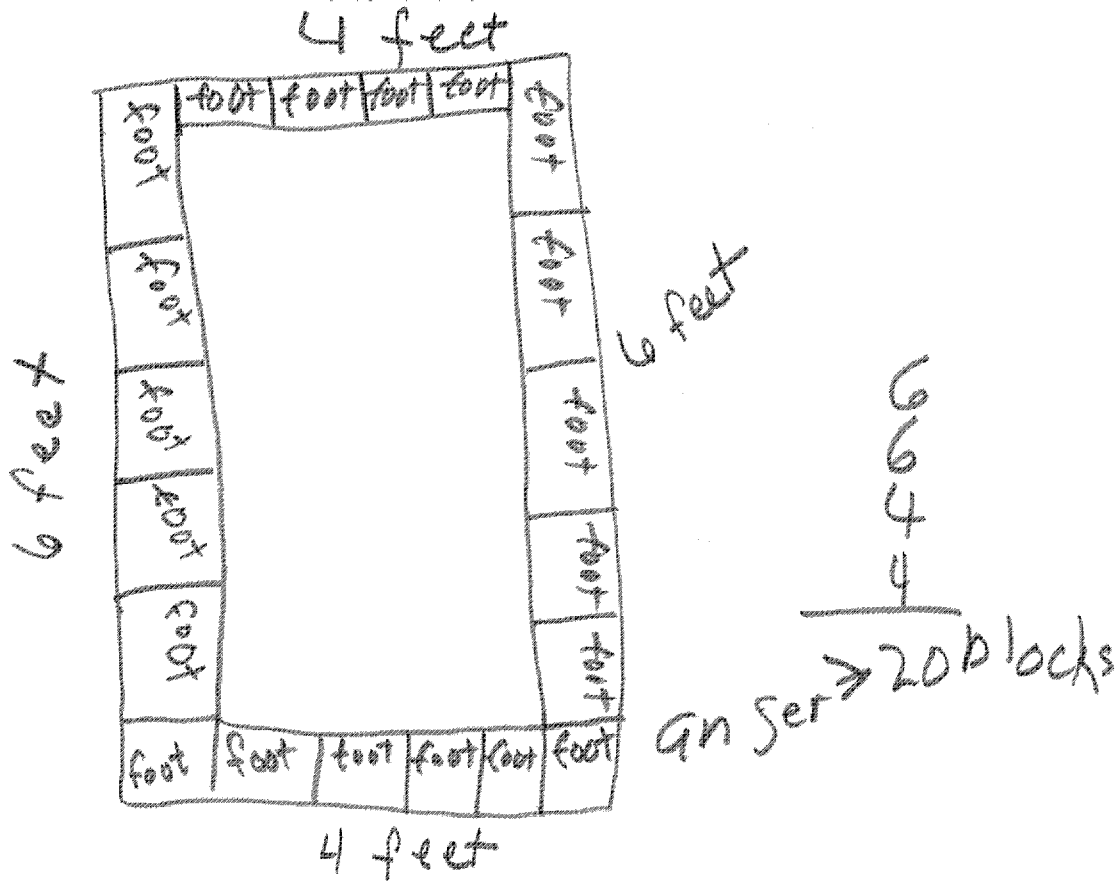
The student has repeated the dimensions given in Part A. The response is incorrect.

MATHEMATICS

B.2 Response Score: 1

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.



The student's answer, procedure, and work are incorrect.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B. Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

This is what he can use. He could use 8 and 3. 8 and 3 make 24. So that can work. Anything that equals 24 you can use. 8 is going to be the length, 3 is going to be the width. That's what he should use.

The student has given one correct set of dimensions and a partially correct explanation.

MATHEMATICS

B.2 Response Score: 0

27. Mrs. Jones and Mr. Garcia are building rectangular patios for their houses. Each is using square blocks that measure 1 foot on each side.

- A. Mrs. Jones wants her patio to be 6 feet long and 4 feet wide. How many blocks does she need to cover the entire space? Show all your work.

$$\begin{array}{r} 6 \\ + 4 \\ \hline 10 \end{array}$$

there will be
20 Blocks

The student's answer and procedure are incorrect.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

MATHEMATICS

27. *Continued.* Please refer to the previous page for task explanation.

- B.** Mr. Garcia wants to use the same number of blocks as Mrs. Jones uses, but he wants his patio to have a different length and width. What are 2 other possible lengths and widths of Mr. Garcia's patio? Explain how you know he will use the same number of blocks as Mrs. Jones.

She could do. 4 feet long and
6 feet wide

The student has repeated the dimensions given in Part A.
The response is incorrect.

