

Mathematics Toolkit: Grade 6 Objective 3.C.1.d

Standard 3.0 Knowledge of Measurement

Topic C. Applications in Measurement

Indicator 1. Estimate and apply measurement formulas

Objective d. Determine missing dimension of a quadrilateral given the perimeter length

Assessment Limits:

Find length in a quadrilateral given the perimeter with whole number dimensions (0 – 200)

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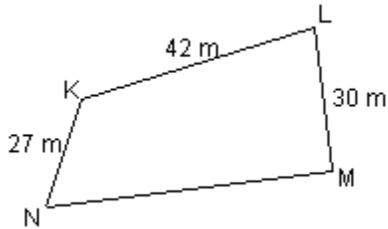
Scoring Rubric

- Rubric - Brief Constructed Response

Sample Item #1 - Selected Response (SR) Item

Mathematics Grade 6 Objective 3.C.1.d

The perimeter of quadrilateral KLMN, as shown below, is 157 meters.

What is the measure, in meters, of \overline{MN} ?

- A. 57 meters
- B. 58 meters
- C. 59 meters
- D. 68 meters

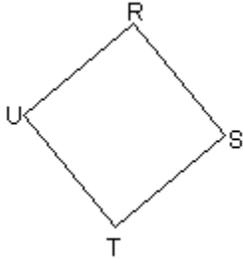
Correct Answer:

B

Sample Item #2 - Selected Response (SR) Item

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Look at square RSTU shown below.



The perimeter of RSTU is 144 inches. What is the measure, in inches, of \overline{ST} ?

- A. 12 inches
- B. 36 inches
- C. 72 inches
- D. 288 inches

Correct Answer:

B

Answer Annotation

- A. 12 inches ($\sqrt{144}$)
- B. 36 inches (correct)
- C. 72 inches ($144 \div 2$)
- D. 288 inches (144×2)

Sample Item #3 - Brief Constructed Response (BCR) Item

Mathematics Grade 6 Objective 3.C.1.d

The perimeter of a rectangular yard is 200 feet. The measure of its width is 40 feet.

Step A

What is the length, in feet, of its length?

Step B

Use what you know about perimeter to explain how you determined the length. Use words, numbers, and/or symbols in your explanation.

Use what you know about perimeter to explain why the length you determined is correct. Use words, numbers, and/or symbols in your explanation.

Answer Annotation

Step A Answer: 60

Step B Sample correct response:

How: Perimeter is the distance around a figure. So for a rectangle, the perimeter is the sum of the width plus the width plus the length plus the length. Since the opposite sides of a rectangle have the same length, the perimeter is $w + w + l + l$, or $2(w) + 2(l) = 200$. If I substitute 40 for w , then I get

$$\begin{array}{r} 2(40) + 2(l) = 200 \\ 80 + 2(l) = 200 \\ -80 \quad -80 \\ 2(l) = 120 \\ l = 60 \end{array}$$

Why: The perimeter of a rectangle is $2(w) + 2(l)$. The perimeter of this rectangle is 200 feet. When I substitute 60 into the equation, it makes it true.

$$\begin{array}{r} 2(w) + 2(l) = 200 \\ 2(40) + 2(60) = 200 \\ 80 + 120 = 200 \\ 200 = 200 \end{array}$$

So the length must be 60 feet.

Rubric - Brief Constructed Response (BCR)

Score 2

The response demonstrates a complete understanding and analysis of a problem.

- Application of a reasonable strategy in the context of the problem is indicated.
- Explanation¹ of and/or justification² for the mathematical process(es) used to solve a problem is clear, developed, and logical.
- Connections and/or extensions made within mathematics or outside of mathematics are clear.
- Supportive information and/or numbers are provided as appropriate.³

Score 1

The response demonstrates a minimal understanding and analysis of a problem.

- Partial application of a strategy in the context of the problem is indicated.
- Explanation¹ of and/or justification² for the mathematical process(es) used to solve a problem is partially developed, logically flawed, or missing.
- Connections and/or extensions made within mathematics or outside of mathematics are partial or overly general, or flawed.
- Supportive information and/or numbers may or may not be provided as appropriate.³

Score 0

The response is completely incorrect, irrelevant to the problem, or missing.⁴

Notes:

- ¹ Explanation refers to students' ability to communicate how they arrived at the solution for an item using the language of mathematics.
- ² Justification refers to students' ability to support the reasoning used to solve a problem, or to demonstrate why the solution is correct using mathematical concepts and principles.
- ³ Students need to complete rubric criteria for explanation, justification, connections and/or extensions as cued for in a given problem.
- ⁴ Merely an exact copy or paraphrase of the problem will receive a score of "0".

Rubric Document Date: August 2003