🧮 AI-Generated Mathematical Reasoning Assessment

Advanced Assessment with Quality Analytics and Plagiarism Detection

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# 📊 Quality Analytics Report

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| --- | --- |
| Quality Score | 58.2% |
| Average Readability | 51.1 |
| Engagement Score | 76.2% |
| Total Questions | 4 |

# 🔍 Plagiarism & Similarity Analysis

Average Similarity: 32.4%

Maximum Similarity: 100.0%

High-Risk Pairs: 2

* • Found 2 question pairs with high similarity. Consider diversifying question types.

# Question 1

**[HARD]** Each student choosing from the school cafeteria menu selects 1 sandwich and 1 drink. The table shows the options available. How many different lunch combinations are possible?

Reference Table:

|  |  |
| --- | --- |
| Sandwich | Drink |
| Turkey | Water |
| Ham | Juice |
| Veggie | Milk |
| Chicken |  |

Options:

(A) 4

(B) 7

(C) 9

**(D) 12 ✓**

(E) 17

### Explanation:

Using the multiplication principle: 4 sandwich options × 3 drink options = 12 total combinations.  
  
\*\*Real-world application:\*\* This applies to menu planning in restaurants and cafeterias.  
  
\*\*Formula:\*\* For independent choices, total combinations = n₁ × n₂

**Curriculum:** Quantitative Math → Data Analysis & Probability → Counting & Arrangement Problems

**Quality Metrics:** Readability: 59.0, Engagement: 95.0%

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# Question 2

**[MODERATE]** A rectangular container holds 6 cubes in a 2×3×1 arrangement of cubic boxes. If each cube has a radius of 2 centimeters, what are the closest dimensions, in centimeters, of the rectangular container?

Options:

**(A) 8 × 12 × 4 ✓**

(B) 4 × 12 × 4

(C) 10 × 14 × 6

(D) 7 × 11 × 4

(E) 8 × 6 × 4

### Explanation:

Each cube has diameter 4 cm. The arrangement requires 8 × 12 × 4 cm dimensions.  
  
\*\*Real-world application:\*\* Essential for logistics and 3D printing space optimization.  
  
\*\*Volume calculation:\*\* V = s³

**Curriculum:** Quantitative Math → Geometry and Measurement → Solid Figures (Volume of Cubes)

**Quality Metrics:** Readability: 44.4, Engagement: 50.0%

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# Question 3

**[HARD]** Each student choosing from the school cafeteria menu selects 1 sandwich and 1 drink. The table shows the options available. How many different lunch combinations are possible?

Reference Table:

|  |  |
| --- | --- |
| Sandwich | Drink |
| Turkey | Water |
| Ham | Juice |
| Veggie | Milk |
| Chicken |  |

Options:

(A) 3

(B) 10

**(C) 12 ✓**

(D) 9

(E) 7

### Explanation:

Using the multiplication principle: 4 sandwich options × 3 drink options = 12 total combinations.  
  
\*\*Real-world application:\*\* This applies to menu planning in restaurants and cafeterias.  
  
\*\*Formula:\*\* For independent choices, total combinations = n₁ × n₂

**Curriculum:** Quantitative Math → Data Analysis & Probability → Counting & Arrangement Problems

**Quality Metrics:** Readability: 59.0, Engagement: 95.0%

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# Question 4

**[MODERATE]** A rectangular container holds 4 cylinders in a 2×2 grid of cylindrical cans. If each cylinder has a radius of 3 centimeters, what are the closest dimensions, in centimeters, of the rectangular container?

Options:

(A) 12 × 6 × 6

**(B) 12 × 12 × 6 ✓**

(C) 14 × 14 × 8

(D) 11 × 11 × 6

(E) 6 × 12 × 6

### Explanation:

Each cylinder has diameter 6 cm. The arrangement requires 12 × 12 × 6 cm dimensions.  
  
\*\*Real-world application:\*\* Used in warehouse storage optimization and shipping container design.  
  
\*\*Volume calculation:\*\* V = \pi r^2 h

**Curriculum:** Quantitative Math → Geometry and Measurement → Solid Figures (Volume of Cubes)

**Quality Metrics:** Readability: 41.9, Engagement: 65.0%

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