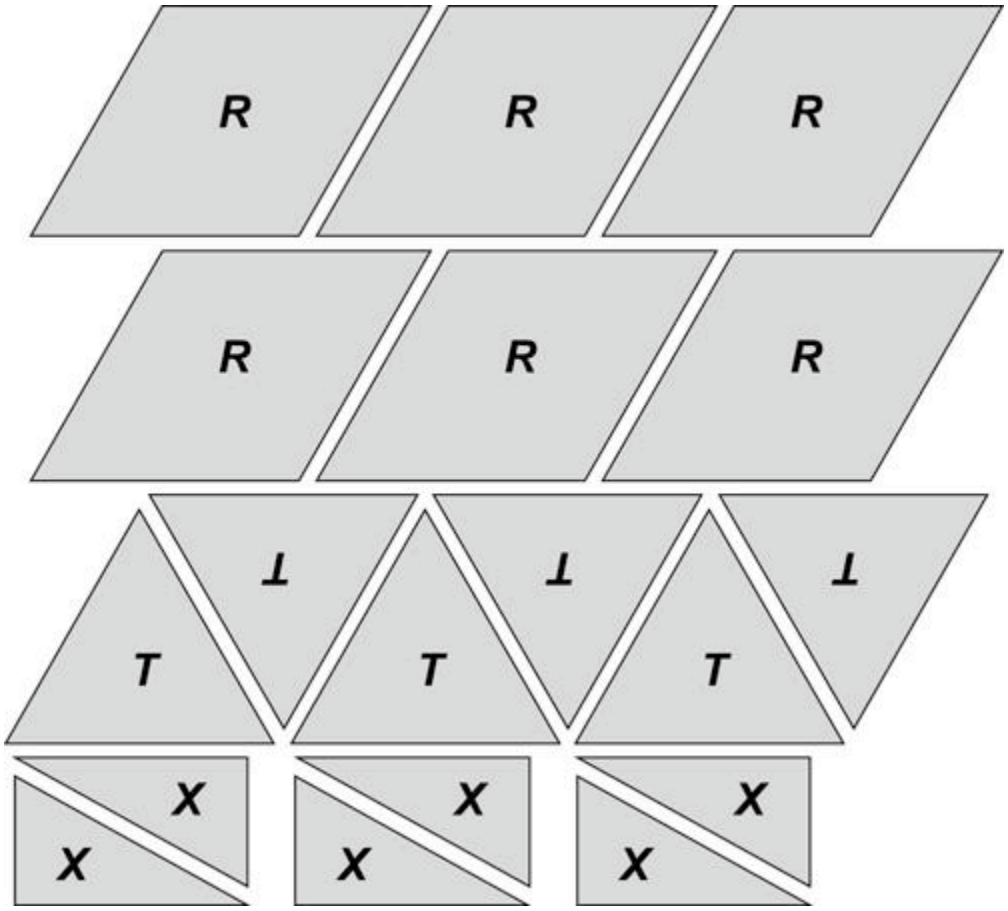
National Assessment of Educational Progress (NAEP)

How did Nebraska Grade 8 students score on the 2009 NAEP Mathematics assessment?

Below are released items from the 2009 NAEP Mathematics assessment.

The students were given these additional materials to help answer a few questions that appear in this sample. [1]



1. Write a three-digit number using the digits 2, 4, and 6 so that the digit 4 means four tens and the digit 6 means six hundreds.

Answer: _____

Scoring Guide

Solution:

642

Score & Description

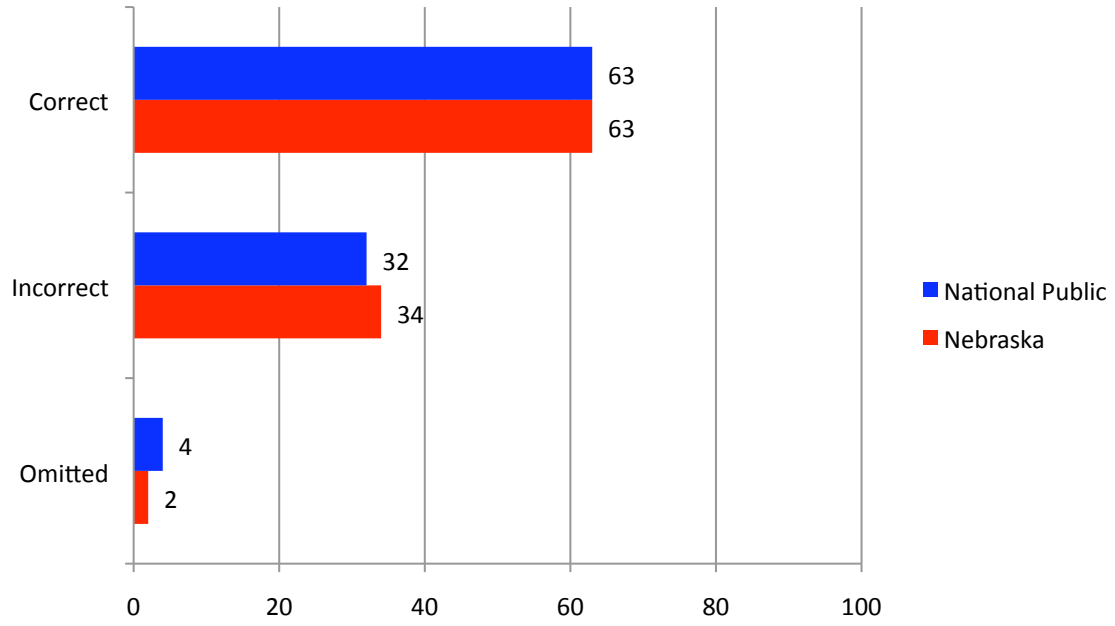
Correct - Student Response

Write a three-digit number using the digits 2, 4, and 6 so that the digit 4 means four tens and the digit 6 means six hundreds.

Answer: _____

642

Percentage of students in each response category in 2009 NAEP Mathematics at grade 8: *Use place value to write a number*



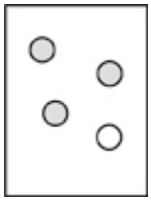
NOTE: These results are for public and nonpublic school students. Percentages may not add to 100 due to rounding. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.

2. Which picture shows that $\frac{3}{4}$ is the same as $\frac{6}{8}$?

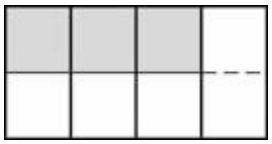
A.

B.

C.

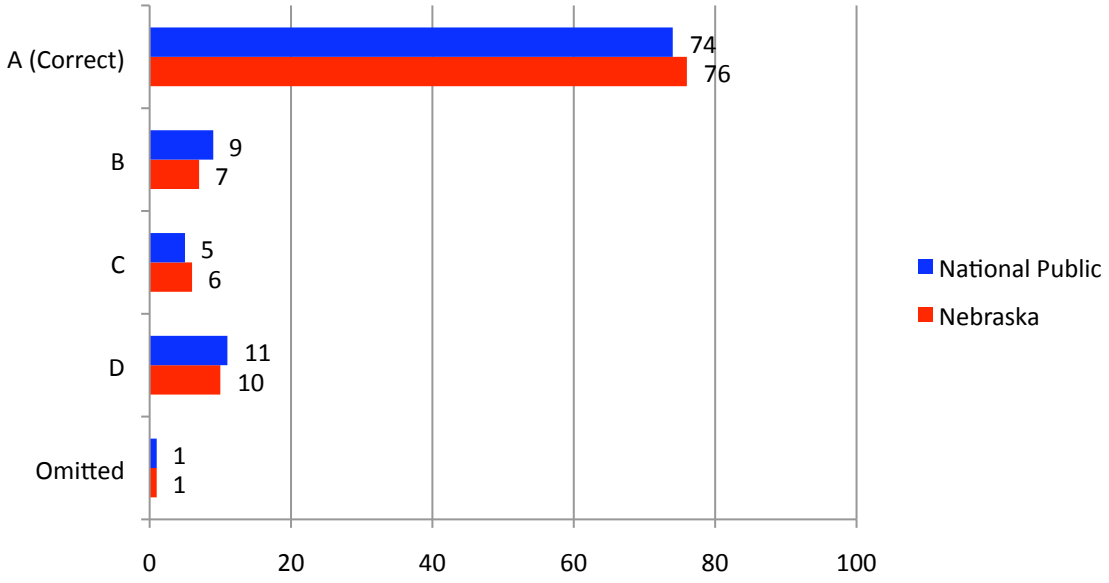


D.



Key: A

Percentage of students in each response category in 2009 NAEP Mathematics at grade 8: *Identify pictorial representation of equivalent fractions*



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Question 3 refers to additional materials [1]
You will need two pieces labeled *X* to answer this question.

3. Use the pieces to make a shape that has these properties.

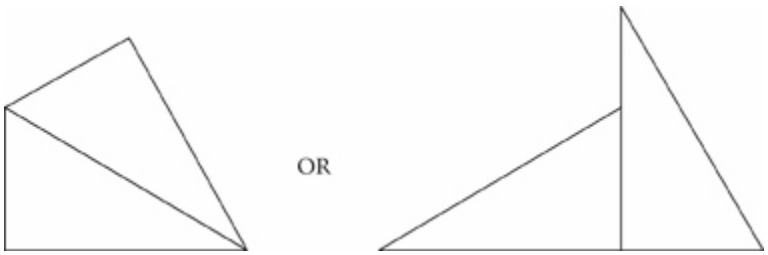
   - It has four sides.
   - No pieces overlap.
   - No two sides are parallel.

In the space below, trace the shape.

Draw the line to show where the two pieces meet.

Scoring Guide

Solution:



Score & Description

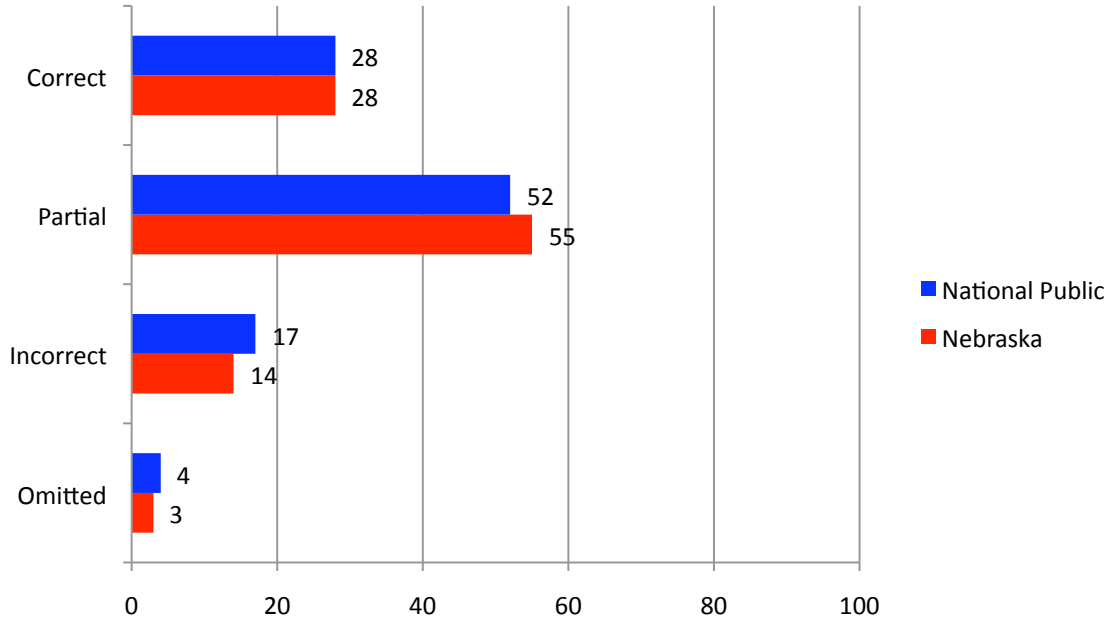
Correct

Correct Response

Partial

A four-sided figure with parallel sides with meeting lines drawn.
OR
A correct shape but meeting line is incorrect.
OR
A 3-sided figure or a figure with more than four sides, and the sides are not parallel with meeting lines drawn.
OR
Either of the correct shapes is drawn without the line where the pieces meet.

Percentage of students in each response category in 2009 NAEP Mathematics at grade 8:
Use given pieces to make shape with certain properties



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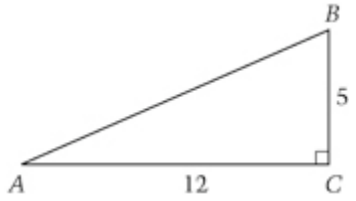


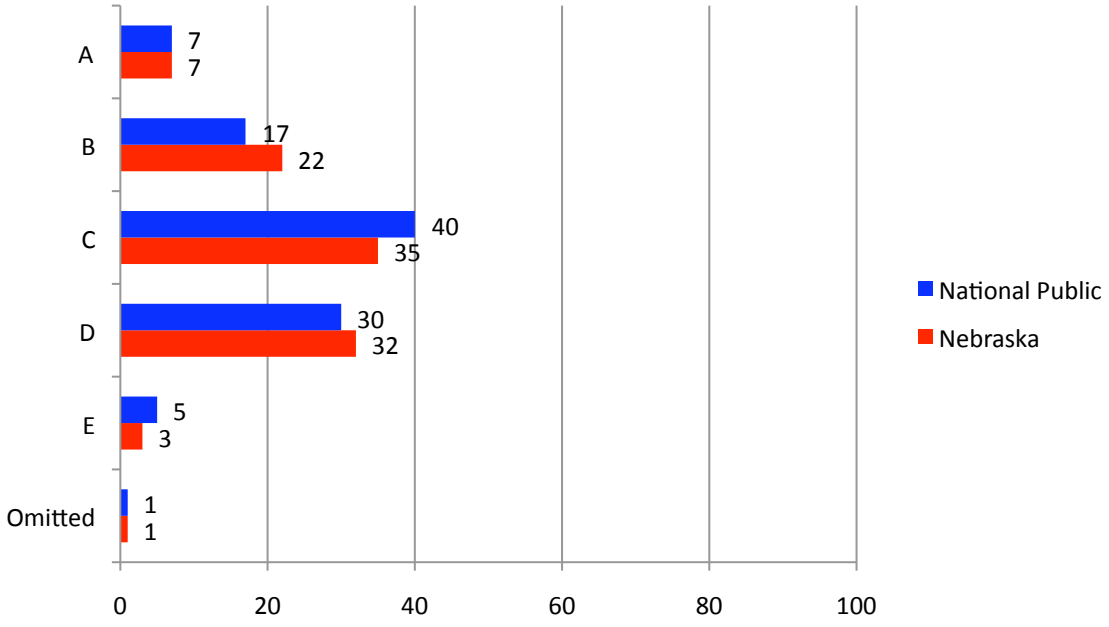
4. In the right triangle above, what is the length of AB ?

A. 8.5
B. 12
C. 13
D. 17
E. 30

<u>Key</u>

C

Percentage of students in each response category in 2009 NAEP Mathematics at grade 8:
Find length of hypotenuse



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5. In the sequence below, the ratio of each term to the term immediately following it is constant. What is the next term of this sequence after 2240 ?

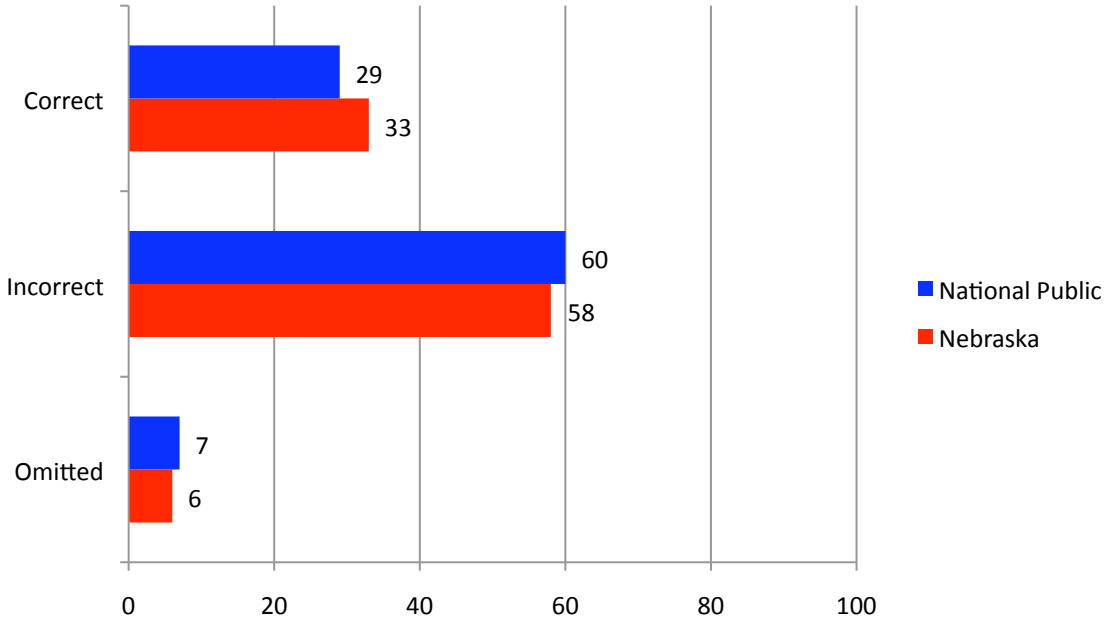
35, 280, 2240, _____

Scoring Guide

Solution:

17,920

Percentage of students in each response category in 2009 NAEP Mathematics at grade 8:
Find the next term in a geometric sequence



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6. The Morrisons are going to build a new one-story house. The floor of the house will be rectangular with a length of 30 feet and a width of 20 feet.

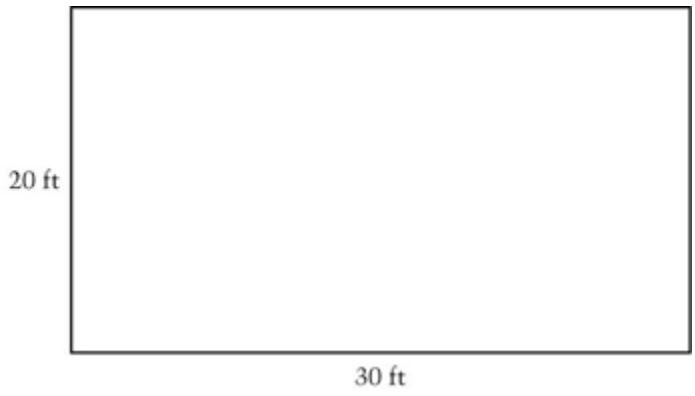
The house will have a living room, a kitchen, two bedrooms, and a bathroom. In part (a) below create a floor plan that shows these five rooms by dividing the rectangle into rooms.

Your floor plan should meet the following conditions.

- Each one of the five rooms must share at least one side with the rectangle in part (a); that is, each room must have at least one outside wall.
-
- The floor area of the bathroom should be 50 square feet.
-
- Each of the other four rooms (not the bathroom) should have a length of at least 10 feet and a width of at least 10 feet.
-

Be sure to label each room by name (living room, kitchen, bedroom, etc.) and include its length and width, in feet. (Do not draw any hallways on your floor plan.)

(a) Draw your floor plan on the figure below. Remember to label your rooms by name and include the length and width, in feet, for each room.



(b) Complete the table below by filling in the floor area, in square feet, for each room in your floor plan.

Room	Floor Area (in square feet)
Living	
Kitchen	
Bedroom	
Bedroom	
Bathroom	
Total Floor Area	600

Scoring Guide

Solution:

There are many possible correct responses. All should contain square or rectangular rooms, a bathroom with an area of 50 square feet, and meet the other required conditions.

For a table to be correct, it must:

1. have entries that add up to 600, and
2. have an area of 50 for the bathroom, and
3. have dimensions for other rooms of at least 10 by 10.

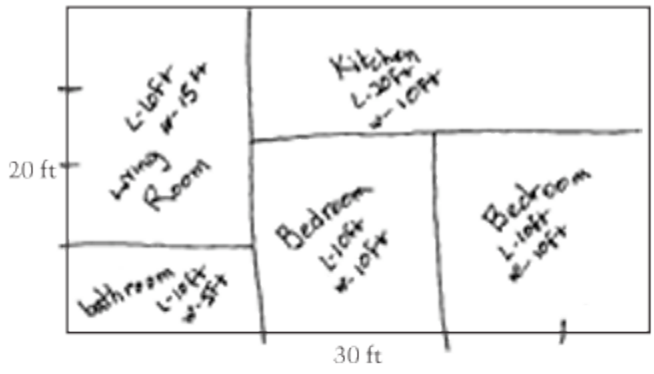
For labeling of the drawing to be considered correct, it must:

1. have name of room, and
2. have room dimensions.

Score & Description

Extended

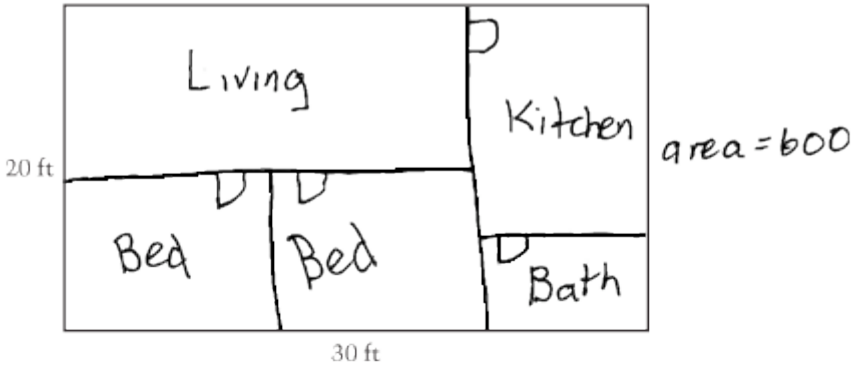
Correct response (complete and correctly labeled)



Room	Floor Area (in square feet)
Living	150 ft²
Kitchen	200 ft²
Bedroom	100 ft²
Bedroom	100 ft²
Bathroom	50 ft²
Total Floor Area	600

Satisfactory

Correct table and correct drawing (in correct proportion) but drawing is missing some or all labels.
OR
Correct drawing (in correct proportion) with all labels correct but table is missing or incomplete.



Room	Floor Area (in square feet)
Living	200
Kitchen	150
Bedroom	100
Bedroom	100
Bathroom	50
Total Floor Area	600

Partial

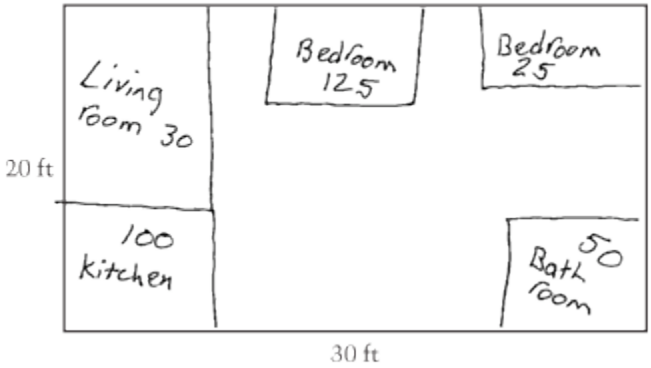
Correct table but drawing is not presented in proportion that is consistent with table (may be because drawing includes an incorrect label).
OR
Correct drawing (in correct proportion) with some correct labeling but table may be incomplete and/or not in agreement with drawing in some respect.
OR
Table adds to 600, rooms are in proportion to table, but bathroom area may not necessarily be 50.

Room	Floor Area (in square feet)
Living	200
Kitchen	175
Bedroom	100
Bedroom	100
Bathroom	25
Total Floor Area	600

Minimal

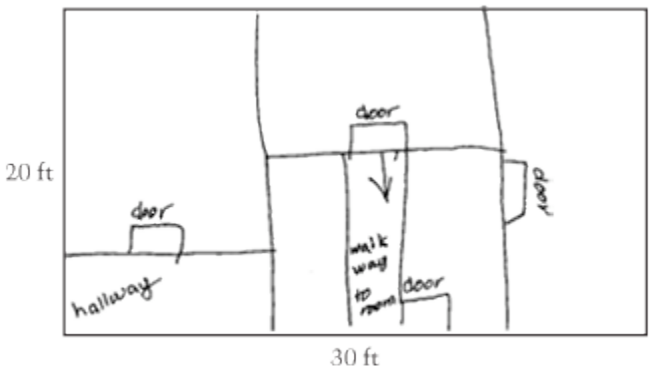
Correct table only.
OR
50 sq. ft. for bathroom represented in some way.
OR
Obtains room areas in table that total to 600.
OR
Drawing contains 5 rooms, each with at least one outside wall, and no hallways.

Room	Floor Area (in square feet)
Living	300
Kitchen	100
Bedroom	125
Bedroom	25
Bathroom	50
Total Floor Area	600

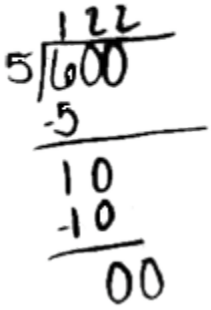


Incorrect

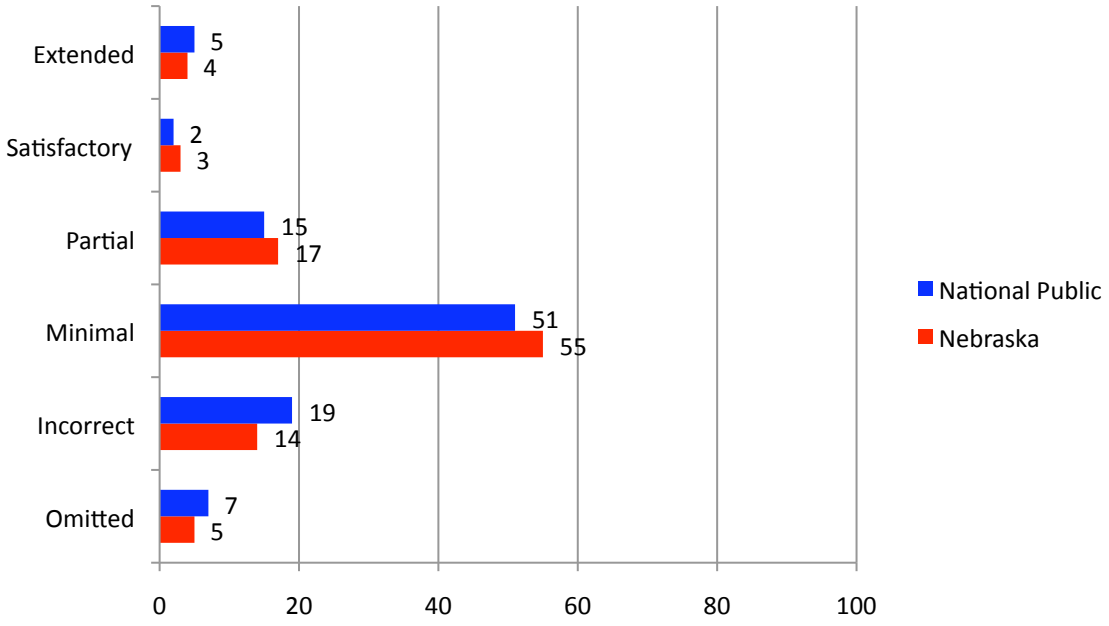
Incorrect response



Room	Floor Area (in square feet)
Living	30
Kitchen	10
Bedroom	5
Bedroom	20
Bathroom	20
Total Floor Area	600



Percentage of students in each response category in 2009 NAEP Mathematics at grade 8:
Draw floor plan given conditions and compute areas



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If you would like more information about the NAEP released items or the NAEP Question Tool contact the Nebraska NAEP State Coordinator, Dr. Ted A. Larson, at (402)-471-2959 or at ted.larson@nebraska.gov.