## POST TEST KEY

**Building a Fish Rack: Investigation into Proof, Properties, Perimeter and Area**

**Math in a Cultural Context***

**UNIVERSITY OF ALASKA FAIRBANKS**

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>POST TEST KEY</th>
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<tbody>
<tr>
<td>Grade:</td>
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<td>Teacher:</td>
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<td>School:</td>
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<td>Location of School:</td>
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<td>Date:</td>
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*This project has been funded by the U.S. Department of Education, *Returning the Gift: Systemic Implementation of an Effective Culturally Based Math Curriculum and Professional Development Program*, Jerry Lipka, P.I.

**Total Score:**
1. Circle the square.

Circle the third shape.

0 points – wrong or 5 points – right

2. Circle the one true statement about the properties of a rectangle.

c. Opposite sides are parallel

0 points – wrong or 5 points – right

3. Rectangle says to Parallelogram, “I am parallelogram too!” How can this be true? Please explain your answer in detail. You may draw pictures to help explain.

A rectangle is a quadrilateral with opposite sides that are equal and parallel, which is the definition of a parallelogram. 5 points

They each have 4 sides = 1 point
They each have 4 angles = 1 point
They are each closed figures = 1 point
Drawings can be given points if they show the above and are labeled. Points would be distributed as indicated above.

[the student may receive 1, 2, 3, or 5 points]
4. You want to measure how much space something covers. What would you be measuring?

**a. area**

0 points – wrong or 5 points – right

5. a. Draw a rectangle that has a perimeter of 16 feet. Label the length and width with numbers.

*Draw a rectangle with dimensions 1 and 7 and note that other correct solutions are possible.*

<table>
<thead>
<tr>
<th>Length</th>
<th>Width x 2</th>
<th>perimeter</th>
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<tbody>
<tr>
<td>7</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>16</td>
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<tr>
<td>4</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

0 points for no rectangle/square
1 point for a drawn rectangle but with no other work
2 points for rectangle and 1 side labeled
3 points for a rectangle and 2 sides labeled but perimeter does not equal 16
5 points for rectangle with sides labeled and perimeter equal to 16

5.b. Now draw a different rectangle with a perimeter of 16 feet. Label the length and width with numbers.

*Draw a rectangle with dimensions 3 and 5 and note that other correct solutions are possible. The table above shows possible solutions*

0 points for no rectangle/square
1 point for a different drawn rectangle but with no other work
2 points for rectangle and 1 side labeled
3 points for a rectangle and 2 sides labeled but perimeter does not equal 16
5 points for rectangle with sides labeled adding up to 16 and side and the bigger number is with the longer side
6. Rectangles A and B both have a perimeter of 20 cm.

Rectangles A and B cover different amounts of space – e.g., A could be 1 x 9 with an area of 9; B could be 5 x 5 with an area of 25 (both would have perimeter of 20 but different areas)  

2-points for this explanation

To receive points the student must show that both rectangles have a perimeter of 20—and show that they have different areas. No deduction for not showing square cm.

7. The perimeter of a square is 24 inches. The equilateral triangle (a triangle with 3 equal sides) below has the same perimeter as the square. What is the length of one side of this equilateral triangle? Circle the correct answer.

6 in

6 in

6 in

6 in

1 inch

6 in

6 in

6 in

1 inch

C. 8 inches

0 points – wrong or 5 points – right
8.a. What is the total distance around the outside of the large rectangle to the right? Be sure to include the correct units.

16 inches or 16 in.  
0 points – wrong    or    5 points – right

8.b. What is the total space inside the large rectangle to the right? Be sure to include the correct units.

15 square inches or 15 sq. in.  
0 points – wrong    or    5 points – right

9. What is the perimeter of the shaded region shown below?  
10 cm.  
no deduction if the student shows only “10”

Each side of a square is 1 cm.  
0 points – wrong    or    5 points – right
10.a. Draw a rectangle that has an area of 36 square inches. Label the length and width with numbers.

**Students draw a rectangle that has dimensions 4 and 9.**

**Other answers are possible, e.g. 2 x 18, 3 x 12 etc.**

0 points for no rectangle/square
1 point for a rectangle with no other work
3 points for rectangle and sides labeled with the lengths multiplying to 36
5 points for rectangle with sides labeled, multiplying sides equals 36 and the longer side and the larger value are aligned.

10.b. Now draw a different rectangle with an area of 36 square inches. Label the length and width with numbers.

**Students draw a rectangle that has dimensions 6 and 6 (i.e., a square with edge length of 6).**

0 points for no rectangle/square
1 point for a rectangle with no other work
3 points for rectangle and sides labeled with the lengths multiplying to 36
5 points for rectangle with sides labeled, multiplying sides equals 36 and the longer side and the larger value are aligned.

11. Make up a story problem in which you need to find the area of a space.

**Many responses are possible, e.g., “I need to tile a (rectangular) room that is 10 feet long and 8 feet wide – how many 1 foot square tiles do I need to tile the room?”**

0 points for no work
1 points for word problem showing perimeter
5 points for word problem that shows area
12. Circle the correct formula for the area of a parallelogram.

   c. \( A = B \times H \)

0 points for the wrong answer and 5 points for the right answer

13. Find the area and perimeter of the figure shown below:

   a. Perimeter = 26 ft. 0 to 5 points

   b. Area = 30 sq. ft. 0 to 5 points
14. Find the area of the following triangle.

Area = 6 sq. in.

0 points for the wrong answer and 5 points for the correct answer