

# **PRE TEST KEY**

## **Building a Smokehouse: The Geometry of Prisms**

A 6<sup>th</sup> grade module

in

## **Math in a Cultural Context \***

**UNIVERSITY OF ALASKA FAIRBANKS**

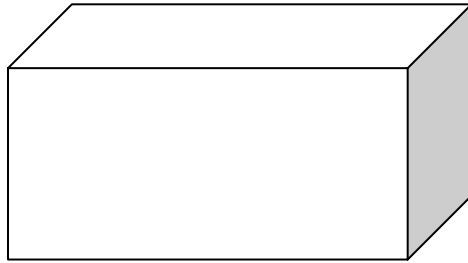
<b>Student Name:</b>	<b>PRE TEST KEY</b>
<b>Grade:</b>	
<b>Teacher:</b>	
<b>School:</b>	
<b>Location of School:</b>	
<b>Date:</b>	

\*This project has been funded by the U.S. Department of Education, *Determining the Potential Efficacy of 6th grade Math in a Cultural Context Project*, Jerry Lipka, P.I.

**Total Score:**

**Total points possible: 31**

1. Below is a rectangular prism.



a. How many faces does the prism have?

Write your answer here: 6

b. How many vertices does the prism have?

Write your answer here: 8

c. How many edges does the prism have?

Write your answer here: 12

**(1 pt. each = 3 pts. total)**

**2. Through drawing, and in your own words, give a definition for a prism**

**a. In the space below, draw a prism.**

**Solid figure (1 pt.)**

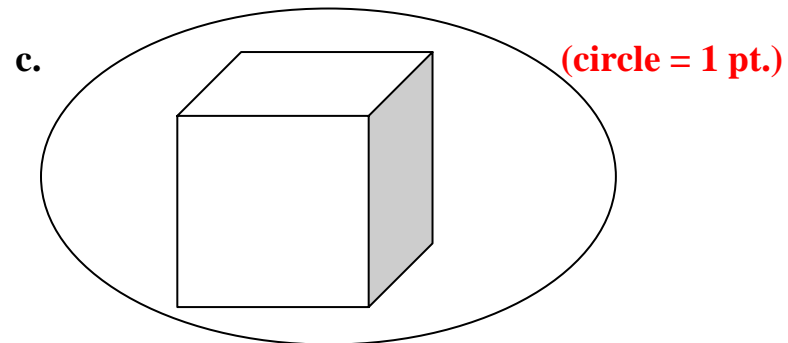
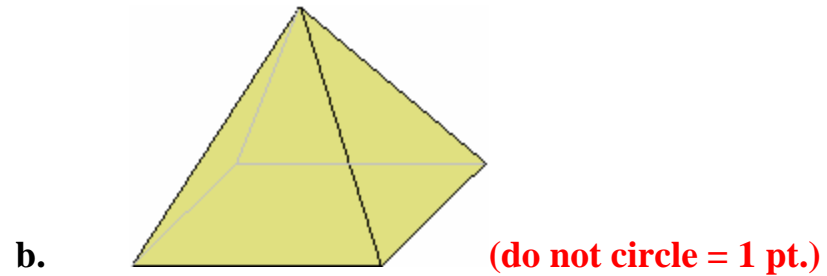
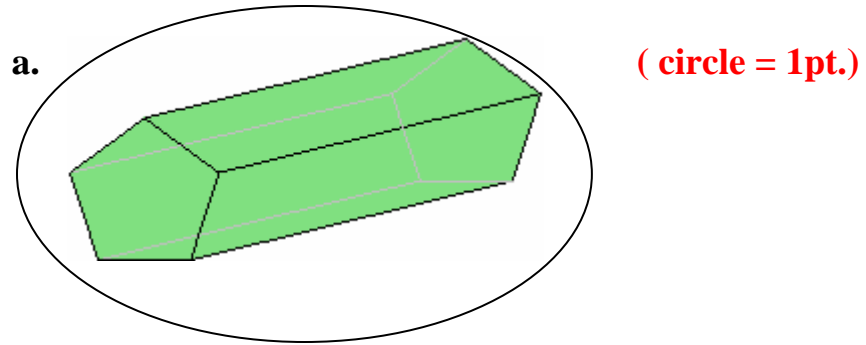
**b. Write a definition for a prism explaining the properties of a prism.**

**Two congruent polygons that are opposite each other (1 pt.)**

**parallelograms/rectangles for all the other faces (1 pt.)**

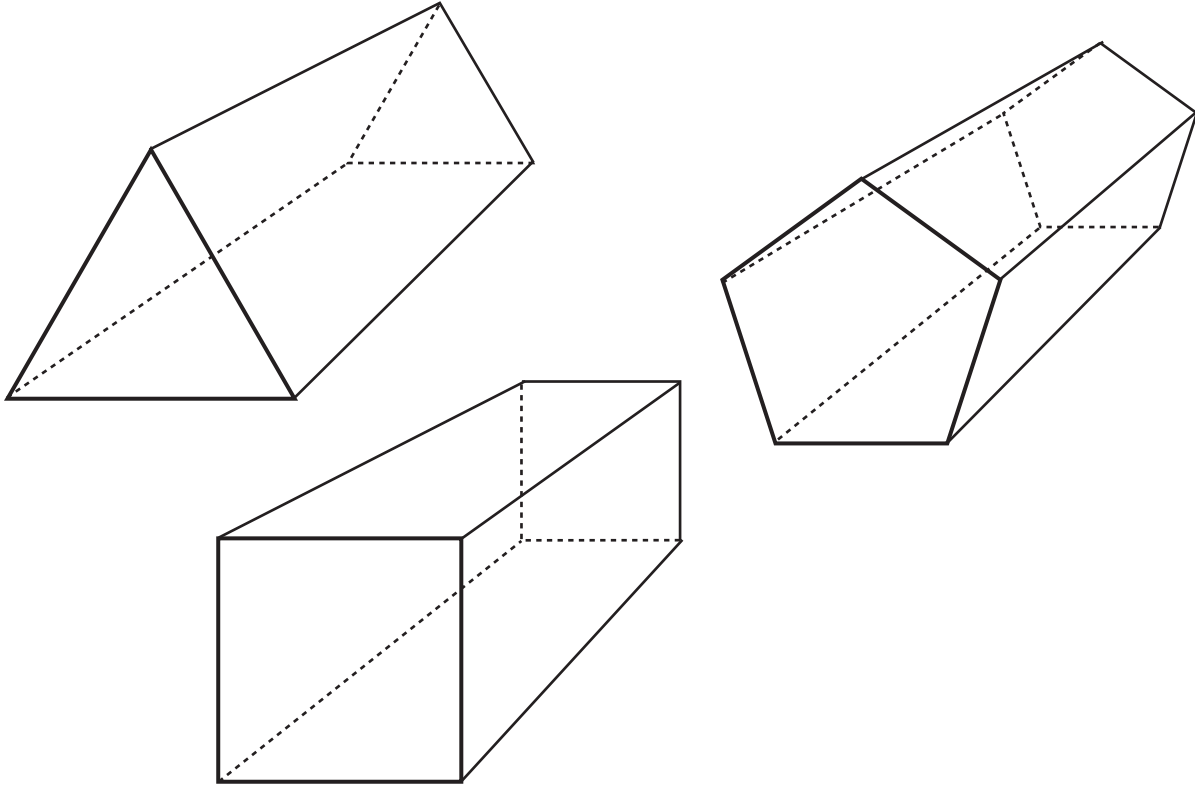
**(3 pts. total)**

3. Circle all the shapes below that are prisms.



(4 pts. total are given if items a and c are the only ones circled and b and d are not circled)

4. Below are drawings of three different types of prisms. Circle the properties that these shapes have in common.



a. All sides are parallel. should not be circled. (do not circle = 1 pt.)

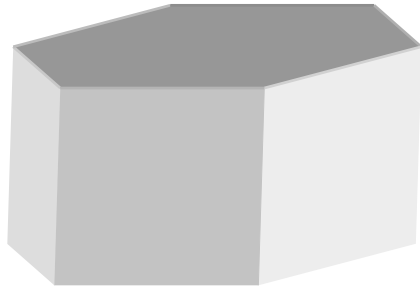
b. At least one pair of sides is parallel. (circle = 1 pt.)

c. Lateral sides are congruent. (circle = 1 pt.)

d. All pairs of sides are congruent. (do not circle = 1 pt.)

(4 pts. total are given if items b and c are the only ones circled and a and d are not circled)

5. What is the correct name for the following shape? Circle the correct name below.



a. Triangular prism

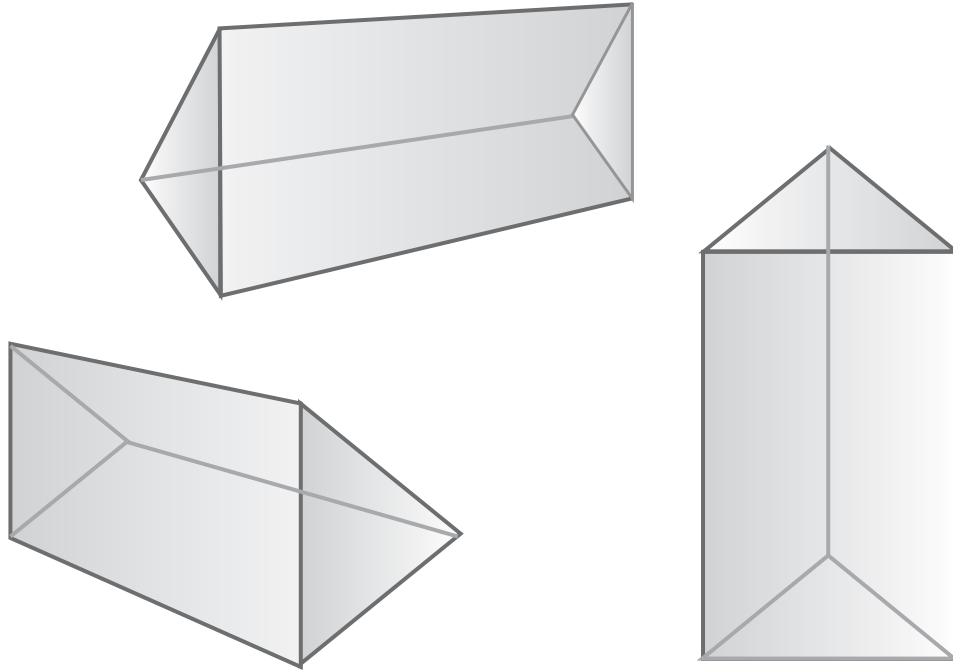
b. Rectangular prism

c. Hexagonal prism

d. Octagonal prism

**(Total of 1 point for circling only choice c)**

6. Look at the drawings below. Are they the same shape or different shapes?  
How do you know?



a. Are they the same shape? Circle:  Yes or No  
(circle yes =1 pt.)

b. Explain your reasoning:

It is the same shape rotated/viewed differently (1 pt.)

(2 pts. total)

**7. You decide to put siding on your house. To figure out how much siding you will need, you should (circle one):**

**a. Add up the areas of each of the sides you want to cover.**

**b. Find how much the house will hold.**

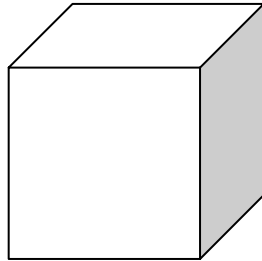
**c. Find the size of the sides.**

**d. Measure the length of the house.**

**e. Measure the length of the diagonals of the house.**

**(Total of 1 pt. for circling only item a)**

8. Below is a cube where each edge length is 3. What is the surface area?



Write your answer here: 54 (square units are not required)

(1 pt. total)

9. You mark out a base of a rectangular shed that is 8 feet by 12 feet.

If you were to build 8-foot high walls for the rectangular shed with a flat roof, what is the total area needed to cover the outside of the walls and the roof? (The door will be cut out from one of the walls later, so just make all your walls solid.). You may draw the shed below to help find the total area to be covered.

a. Write your answer here: 416 (units of sq. feet are not required)

(2 pts. )

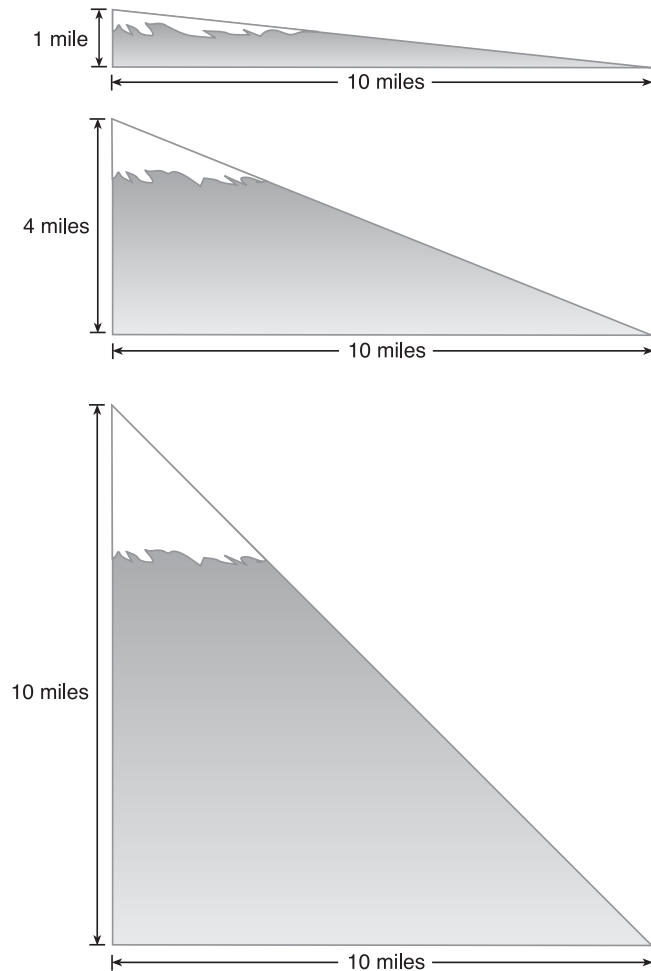
b. Explain how you found your answer

(e.g., found the surface area of a prism that is 8 x 8 x 12 and then subtracted the area of the floor since that does not need to be covered) 2 pts. for a complete explanation

(4 pts. total)

10. Avalanches are a danger for anyone in the mountains of Alaska. The slope of the mountainside determines how much avalanche danger there is. In Alaska, because we tend to have dry, granular snow, the slope that has the most danger for avalanches is 0.4.

a. Look at the drawings of the mountains below. Circle the one which has a slope that would be the most likely to have an avalanche.



**(1 pt. for picking the middle drawing)**

b. Explain your reasoning:

**(1 pt. for explaining that  $4/10 = 0.4$  for the slope)**

**(2 pts. total)**

11. Can a triangle have two right angles?

a. Circle the correct answer:

YES

NO

NO, a triangle can't have two right angles. (1 pt.)

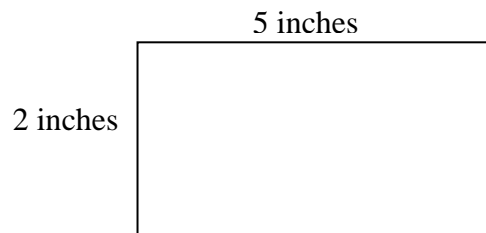
b. Why or why not? Explain your answer.

(Feel free to include drawings with your explanation below.)

Two right angles would add up to 180 degrees leaving no angle measure for the third angle of the triangle (i.e., the three angles of a triangle have to add to exactly 180 degrees). (1 pt.)

**(2 pts total)**

12. Below is a rectangle. If you taped the two short ends together to make a tube, what would be the circumference of this tube?



a. Write the correct answer here: 5 (units not required) (1 pt.)

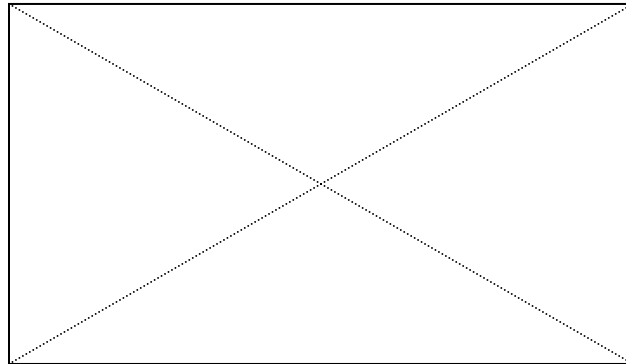
b. Explain your answer here:

(Feel free to include drawings with your explanation below.)

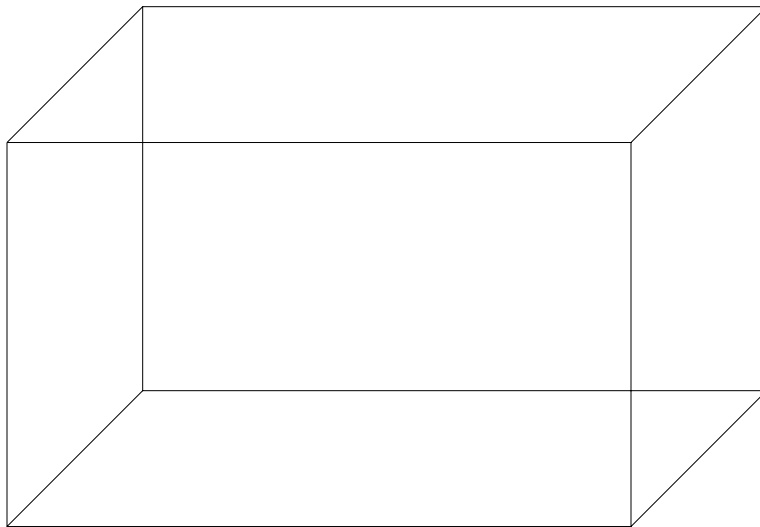
By taping the short sides of the rectangle together the long side becomes the circumference of the circular ends of the tube. (1 pt.)

(2 pts. total)

**13. Below is a rectangle with the center of the rectangle shown:**



**Locate the center of the prism below and show how you found it:**



**Students should draw in the diagonals of the prism as shown below (1 pt.) and indicate the point where all three intersect is the center of the prism. It can also be done by drawing line segments that connect the center of opposite faces (1 pt.) (2 pts. total)**

