

POST TEST KEY

Patterns and Parkas

Investigating Geometric Principles, Shapes, Patterns, and Measurement
Grade Level 2

Math in a Cultural Context*

UNIVERSITY OF ALASKA FAIRBANKS

Student Name:	PRE TEST KEY
Grade:	
Teacher:	
School:	
Location of School:	
Date:	

*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.

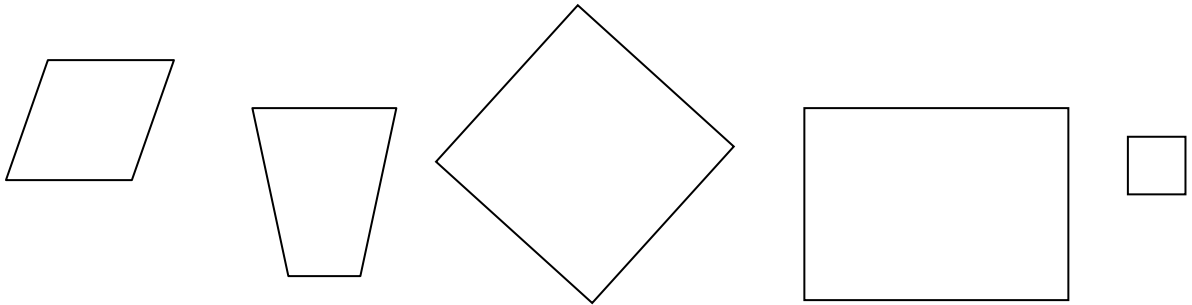
41 total points

Total Score:

PLEASE NOTE:

FOR ITEM #8 STUDENTS WILL EACH NEED 6 RIGHT TRIANGLES.

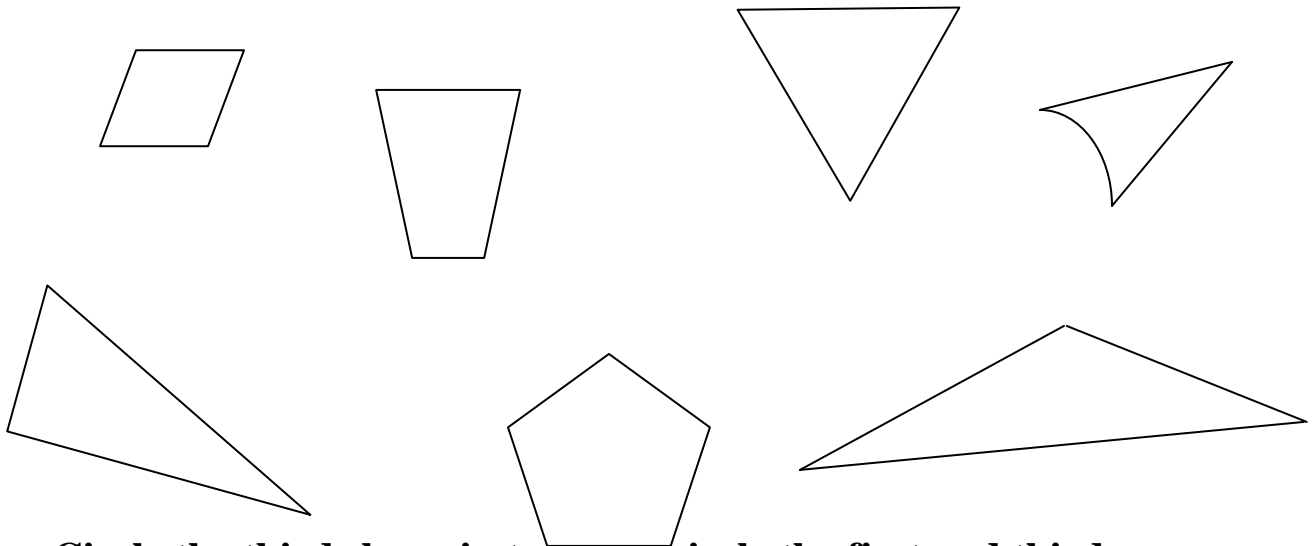
1. Draw a ring around the shapes that are squares.



Total of 2 points:

- **Full credit: circling 3rd and last (2 points)**
- **Partial credit: circling 3rd or last and nothing else(1 point)**
- **Anything else (0 points)**

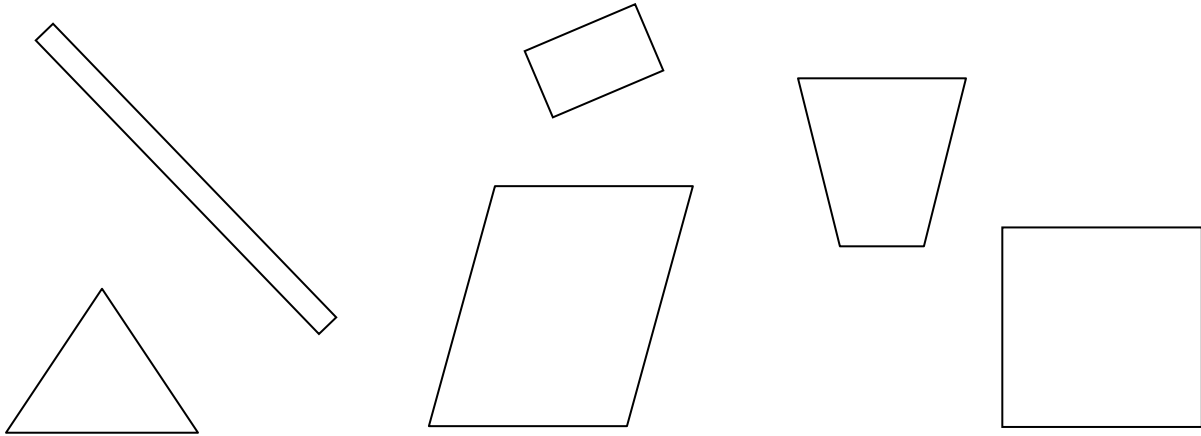
2. Draw a ring around the shapes that are triangles.



Circle the third shape in top row, circle the first and third shapes in the bottom row. Total of 3 points.

- **Full credit: circling each triangle (3 points)**
- **Partial credit: circling all three triangles and one incorrect shape or circling only two of the three triangles: partial credit (2 points)**
- **Any other response (0 points)**

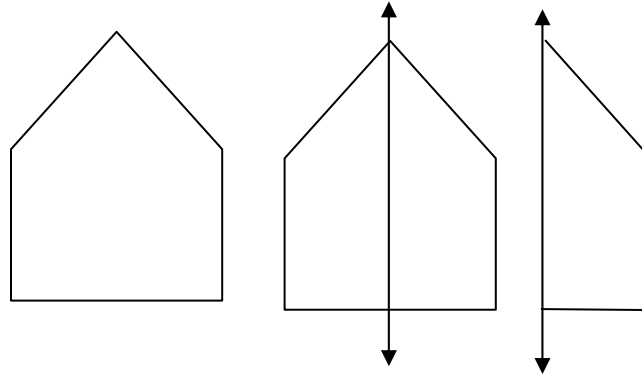
3. Draw a ring around the shapes that are rectangles.



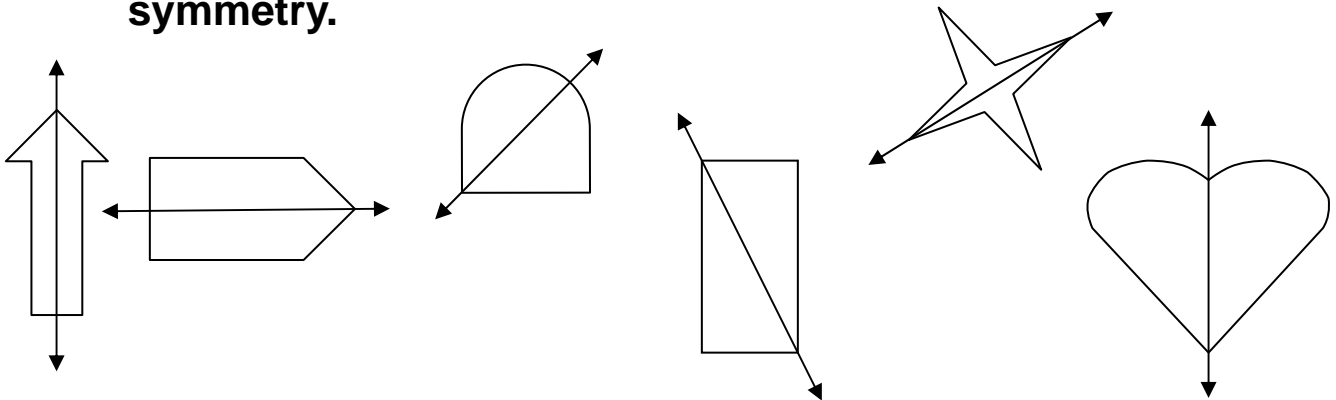
Circle the first and second shapes in top row and last shape bottom row. Total of 3 points.

- **Full credit: circling each rectangle (3 points)**
- **Partial credit: circling all three rectangle and one incorrect shape or circling only two of the three rectangles (2 points)**
- **Any other response (0 points)**

A shape has symmetry if you can fold it so that one side fits exactly on top of the other side. The line you fold the shape on is called a line of symmetry.



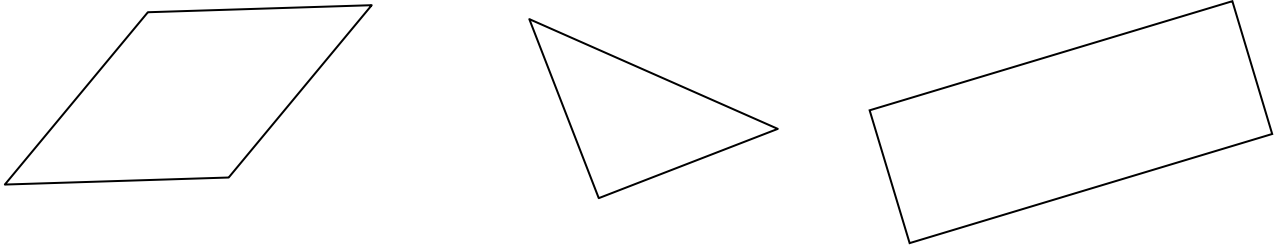
4. Draw a ring around the shapes that show a line of symmetry.



Circle the first, second, fifth, and sixth shapes. Total of 4 points.

- **Full credit: 4 correct shapes circled and nothing else (4 points)**
- **Partial credit: 3 correct shapes circled and only one incorrect shape circled (2 points)**
- **Any other response (0 points)**

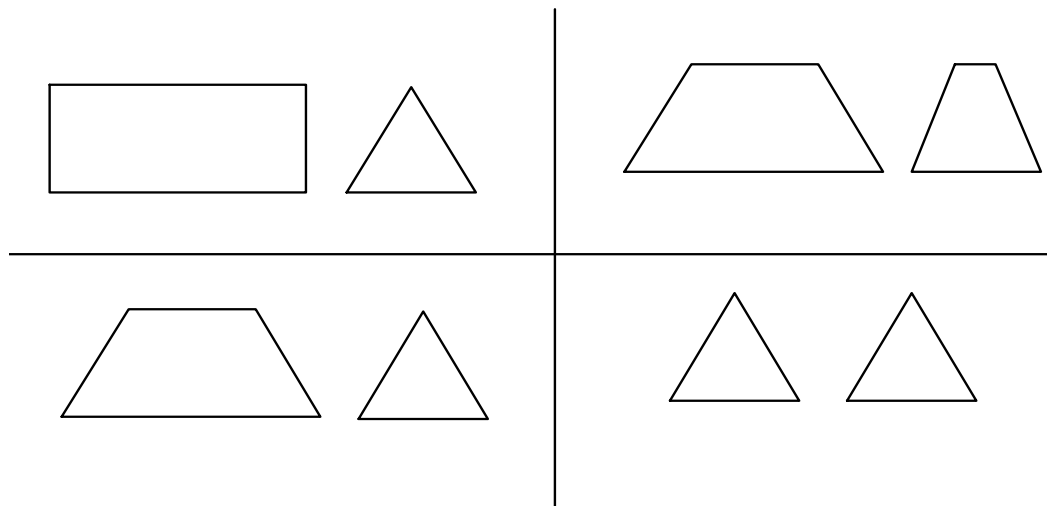
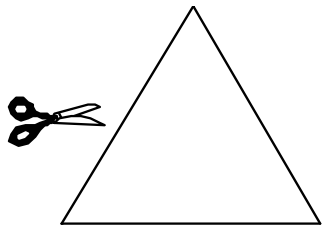
5. Draw all of the lines of symmetry in each shape below.
Some shapes have more than one line of symmetry.



1 point for each line of symmetry—Total of 5 points

- **First has 2 lines of symmetry (2 points)**
- **Second has 1 line of symmetry (1 point)**
- **Third has 2 lines of symmetry (2 points)**

6. Pretend to cut the large triangle into two pieces with one cut. One of the choices below shows how the two pieces will look. Circle the correct choice.



The bottom-left choice is correct (1 point)

7. Here is a rectangle.

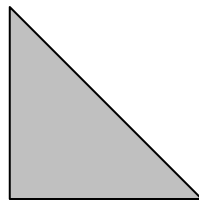


About how many rectangles long is the line below?
Draw marks on the line to show how many rectangles.



Write the answer here: About 4 of the shaded rectangles are needed; students must show repeated unit on line (1 point)

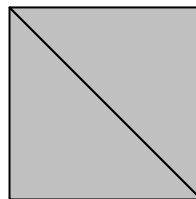
8. Take out six of the envelope.



pieces in your

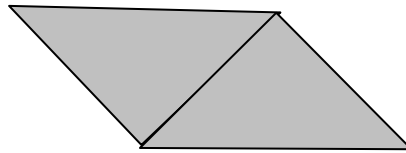
a. Use two of the triangles to make a 4-sided shape. Glue your shape here.

Any 4-sided shape made with 2 triangles (1 point)



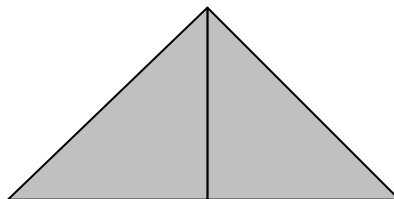
b. Use two of the triangles to make a different 4- sided shape. Glue your shape here.

Any 4-sided shape made with 2 triangles that is different than the shape in 8a (no points for rotated square) (1 point)

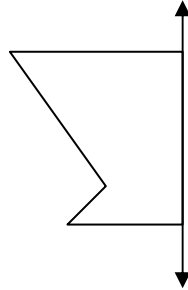


c. Use two of the triangles to make a 3-sided shape. Glue your shape here.

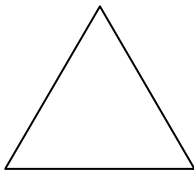
Any 3-sided shape made with 2 triangles (1 point)



9. Half of this shape is missing and the line of symmetry is for the whole shape. Draw the half of the shape that is missing.

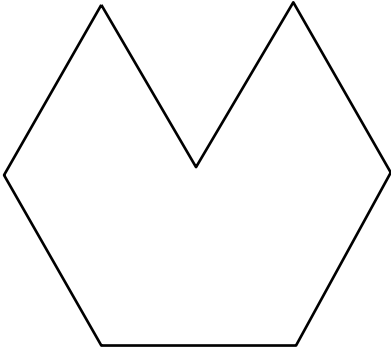


Student should draw the shape reflected over the given line of symmetry (1 point).

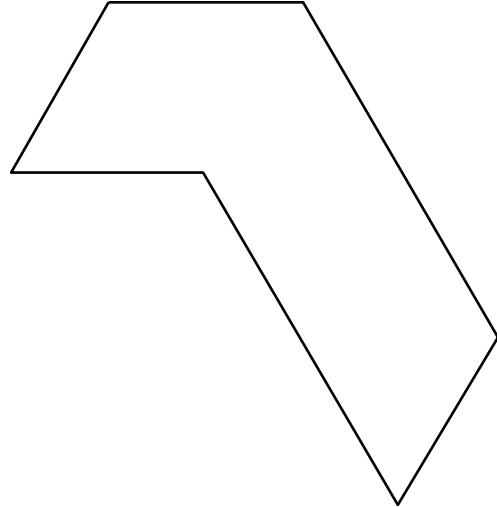
10. How many  fit in each shape?

1 point each for a total of 4 points

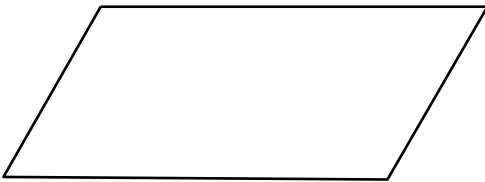
a. How many? **5**



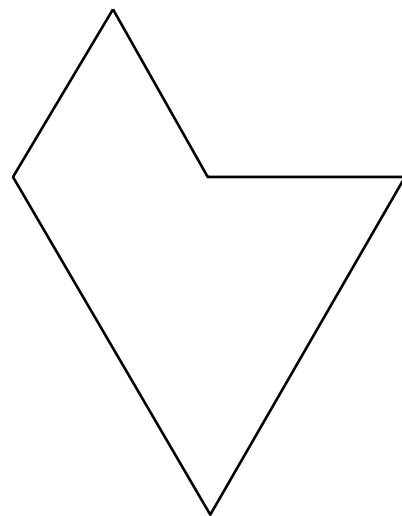
b. How many? **6**



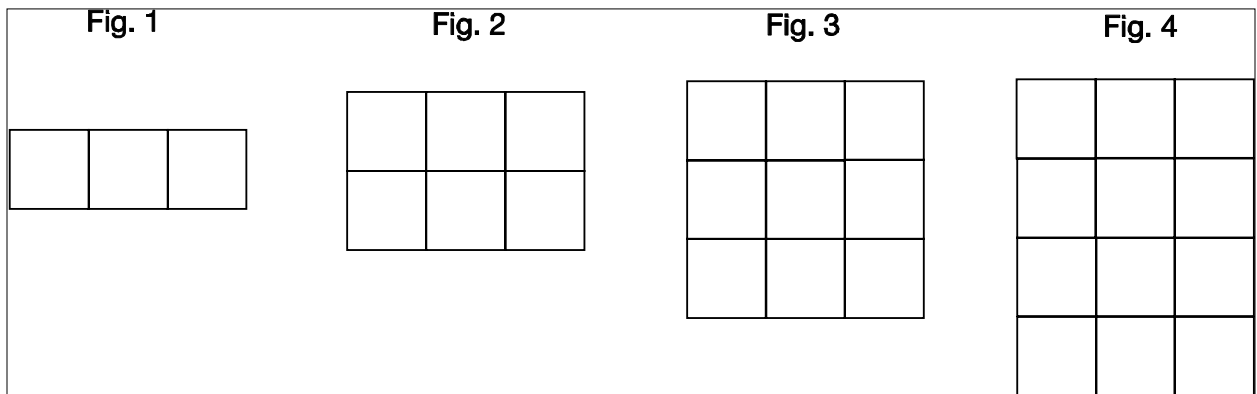
c. How many? **4**



d. How many? **5**



11. Here is the beginning of a pattern of squares.



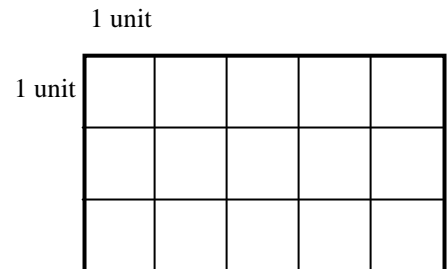
a. Draw a picture of Fig. 4.

Students should draw a square pattern of 4 rows and 3 columns of squares (1 point)

b. How many squares will be in Fig. 4?

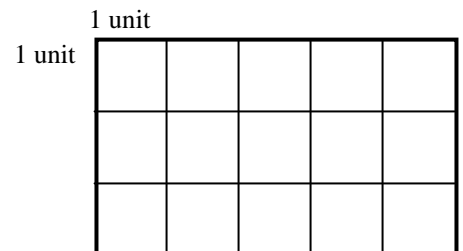
Write the answer here **12 (1 point)**

12a. What is the total distance around the outside of the large rectangle to the right? Be sure to include the correct units.



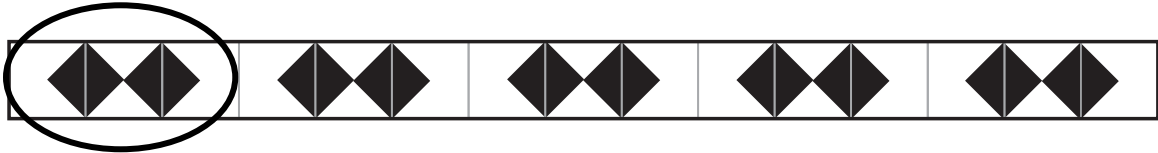
16 units or, accept 16 (1 point)

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



15 square units or, accept 15 (1 point)

13. In each pattern, two or more shapes repeat to make the whole pattern. Circle the shapes or parts that repeat to fill the strip. The first one has been done for you.



a.



b.



c.



d.



- a. Is star-heart repeated (1 point)
- b. Is square with black upper left-square with black upper right repeated; said differently the first four columns (1point)
- c. Is paw-leaf-leaf repeated (1 point)
- d. Is 1-1-3 repeated (1 point)

14. Look at Pattern 1

Pattern 1

A	B	A	B	A	B	A	B	A	B
---	---	---	---	---	---	---	---	---	---

Which of the patterns below repeat in the same way as Pattern 1? Circle all the correct answers. There is more than one correct answer.

Patterns a c are ab patterns and b is a abba 47

a.

7	4	7	4	7	4	7	4	7	4
---	---	---	---	---	---	---	---	---	---

b.

7	4	4	7	7	4	4	7	7	4	4	7
---	---	---	---	---	---	---	---	---	---	---	---

c.

4	7	4	7	4	7	4	7	4	7
---	---	---	---	---	---	---	---	---	---

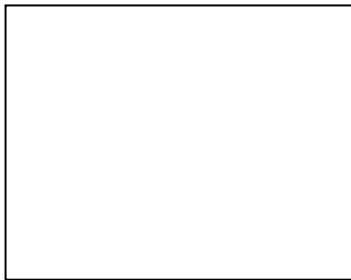
Total of 3 points. 1 point for circling the pattern in a and c and 1 point for not ringing b.

15 a. Use your pencil to draw lines to make the square below have 4 equal parts.



Can be divided along the lines of squares; diagonals, vertical and horizontal lines of symmetry; 4 equal rows or columns, there are other possibilities (1 point)

b. Use your pencil to shade $\frac{3}{4}$ of this square.



Student divides the square into 4 equal parts as in "a" above and shades in 3 of the 4 parts (1 point)

16. See the grid below. What fraction is shaded?

b. 3/15 (1 point)

