

Shape Statements

1. James says:

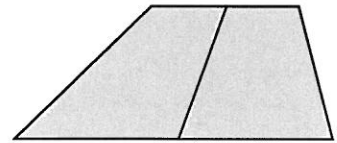
If you draw two shapes, the shape with the greater area will also have the longer perimeter.

Is James' statement **Always, Sometimes or Never True?**

Fully explain and illustrate your answer.

2. Clara says:

If you join the midpoints of the opposite sides of a trapezoid, you split the trapezoid into two equal areas.

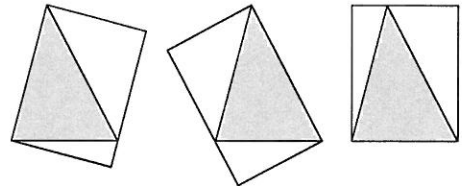


Is Clara's statement **Always, Sometimes or Never True?**

Fully explain and illustrate your answer.

3. Alex says:

There are three different ways of drawing a rectangle around a triangle, so that it passes through all three vertices and shares an edge. The areas of the rectangles are equal.



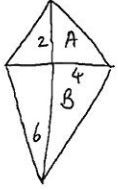
Is Alex's statement **Always, Sometimes or Never True?**

Fully explain and illustrate your answer.

Student Work: Diagonals of a Quadrilateral

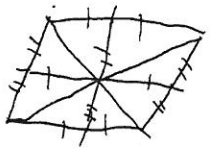
Below is some work by two students. Assess their work by answering these questions:

- What do you like about the work?
- Has the student made any assumptions?
- Is the work accurate?
- How can the explanation be improved?



A	B
$\frac{1}{2} \cdot 4 \cdot 2$	$\frac{1}{2} \cdot 4 \cdot 6$
$\frac{1}{2} \cdot 8$	$\frac{1}{2} \cdot 24$
$\neq 4$	12

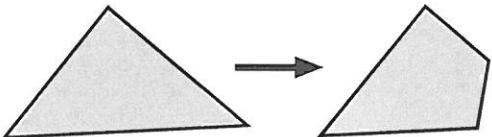
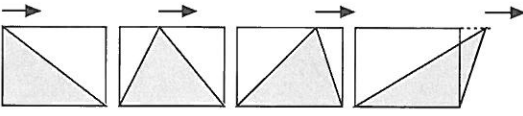
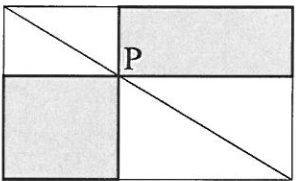
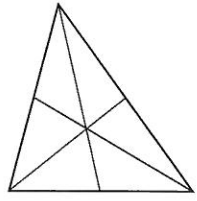
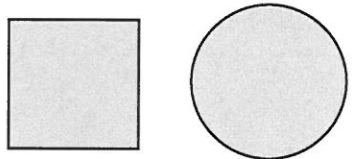
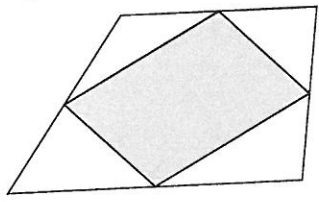
Kite = not true



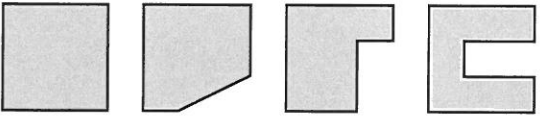
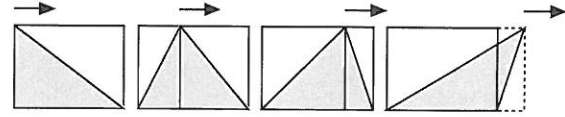
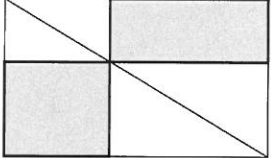
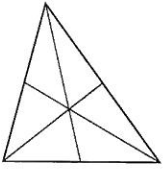
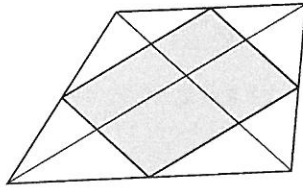
All triangles are congruent (SSS)

Parallelogram = always true

Card Set A: Always, Sometimes, or Never True?

<p>A Cutting Shapes</p>  <p>When you cut a piece off a shape you:</p> <p>(a) Reduce its area. (b) Reduce its perimeter.</p>	<p>B Sliding a Triangle</p>  <p>If you slide the top corner of a triangle from left to right:</p> <p>(a) Its area stays the same. (b) Its perimeter changes.</p>
<p>C Rectangles</p>  <p>Draw a diagonal of a rectangle and mark any point on it as P. Draw lines through P, parallel to the sides of the rectangle. The two shaded rectangles have:</p> <p>(a) Equal areas. (b) Equal perimeters.</p>	<p>D Medians of a Triangle</p>  <p>If you join each vertex of a triangle to the midpoint of the opposite side, the six triangles you get all have the same area.</p>
<p>E Square and Circle</p>  <p>If a square and a circle have the same perimeter, the circle has the smallest area.</p>	<p>F Midpoints of a Quadrilateral</p>  <p>If you join the midpoints of the sides of a quadrilateral, you get a parallelogram with one half the area of the original quadrilateral.</p>

Card Set B: Some Hints

<p>A Cutting Shapes</p> <p>What happens to the area and perimeter when you cut pieces off this square in different ways?</p> <p>Generalize!</p> 	<p>B Sliding a Triangle</p>  <p>Divide the shaded triangle into smaller triangles as shown.</p> <p>What fraction of the rectangle is the shaded area in each case?</p> <p>Will this work in extreme cases?</p>
<p>C Rectangles</p>  <p>What happens in extreme cases? Which pairs of lengths and areas <i>are</i> equal? Don't forget the two large triangles made by the diagonal and the sides of the rectangle.</p>	<p>D Medians of a Triangle</p>  <p>Find pairs of triangles that share the same base and height. Don't just look at the small triangles!</p>
<p>E Square and Circle</p> <p>Suppose the square and circle have a perimeter of 4 units. What are their areas? Does it matter what the perimeter is? Why?</p>	<p>F Midpoints of a Quadrilateral</p>  <p>Try joining the diagonals of the quadrilateral. Which lengths and angles must be equal?</p>