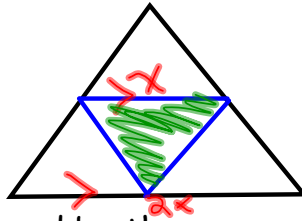


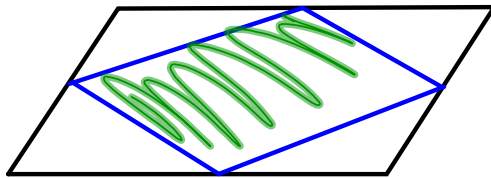
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## 7.5 Reasoning About Properties of Polygons

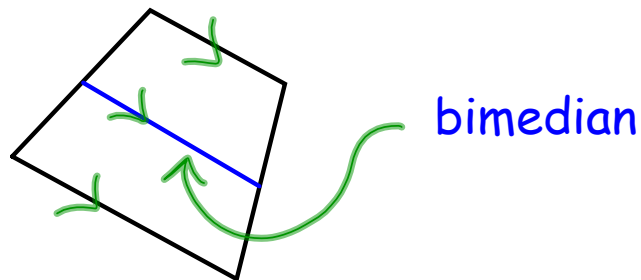
The triangle formed by the connection of the midsegments of the original triangle is  $\frac{1}{4}$  of the area of the original triangle



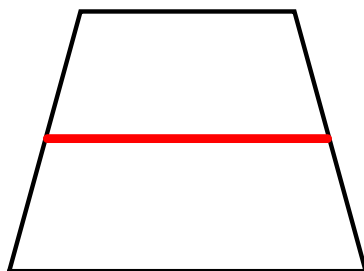
The quadrilateral formed by the connection of the midsegments of the original quadrilateral is  $\frac{1}{2}$  of the area of the original quadrilateral



The slope of the bimedial of the two non-parallel sides of a trapezoid is the same as the slope of the two parallel sides

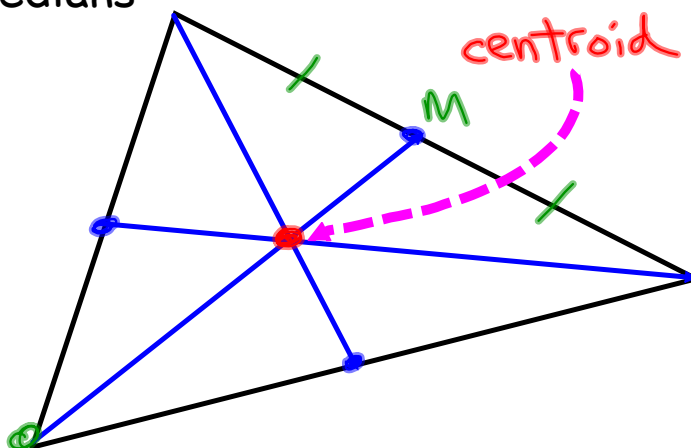


The length of the bimedial of the two non-parallel sides of a trapezoid is the average of the length of the two parallel sides



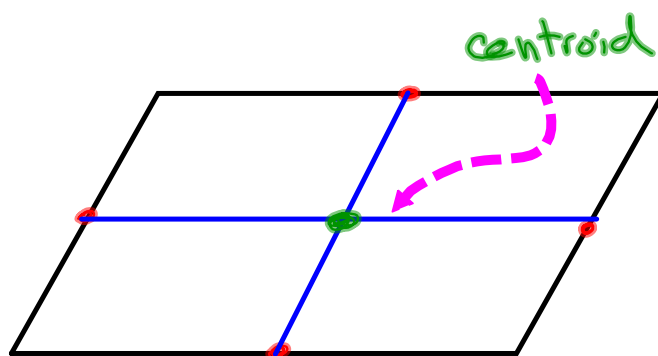
Also:

The centroid (centre of mass) of a triangle can be determined by finding the intersection point of the medians



The centroid (centre of mass) of some quadrilaterals can be determined by:

- Construct the bimedians.
- Find the intersection of the bimedians - this is your centroid!

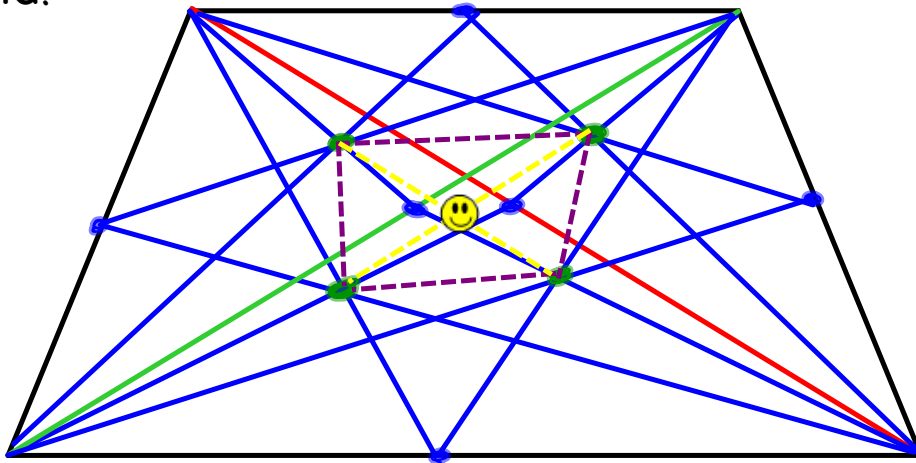


This method works for squares, rhombuses, rectangles and parallelograms

This method does not work for trapezoids and kites !

The centroid (centre of mass) of a quadrilateral can be determined by:

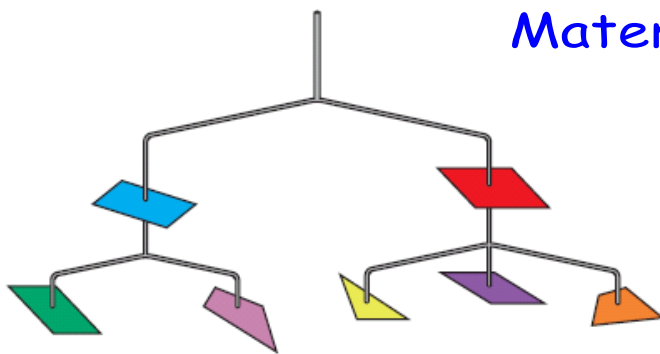
- Constructing one diagonal of the quadrilateral (This divides the shape into two triangles)
- Find the centroid of each of these triangles and mark them
- Construct the second diagonal of the quadrilateral (dividing the shape into two more triangles)
- Find the centroid of each of these triangles and mark them
- Connect the four centroids to form an inner quadrilateral
- Construct the diagonals of this inner quadrilateral and mark the intersection point - this is your centroid!



The centroid will be lower than the bimedian in a trapezoid

homework:  
p. 414 #4, 5, 7

### Culminating Unit Task: Mobile Build



Materials: Masking Tape  
Coloured Paper  
Scissors  
Ruler  
Straws  
String

Construct a mobile using triangular and quadrilateral and at least one other shape.

You must:

- Have your shapes (at least 6) hang horizontally from a piece of string
- Use a variety of different convex triangles and quadrilaterals
- one quadrilateral centroid determined using second method.