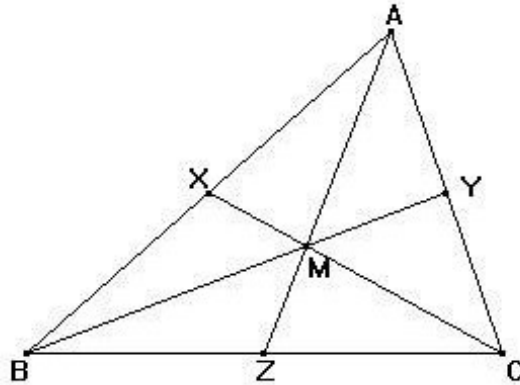


## Ceva's Theorem

### Problem 1:

Finding the center of mass of a triangle. Use GSP for the activity.

1. Construct triangle ABC.
2. Find the midpoint of sides  $\overline{AB}$ ,  $\overline{BC}$ , and  $\overline{CA}$ .
3. Construct the medians  $\overline{AZ}$ ,  $\overline{BY}$ , and  $\overline{CX}$ .



4. Drag vertices A, B, or C. Is there ever a time when the medians  $\overline{AZ}$ ,  $\overline{BY}$ , and  $\overline{CX}$  do not intersect? Explain why or why not?
5. What do you notice about the midpoints X, Y, Z when the lengths of the sides are changed?
6. What do you notice about the point M when dragging the three vertices?

*The point M where the medians of a triangle meet is called the center of masses or Centroid of the triangle.*

Create segments  $\overline{AM}$ ,  $\overline{BM}$ ,  $\overline{CM}$ ,  $\overline{XM}$ ,  $\overline{YM}$ ,  $\overline{ZM}$

7. Measure the lengths of the segments.

8. Calculate  $\frac{BM}{BY}$ ,  $\frac{CM}{CX}$ , and  $\frac{AM}{AZ}$ . What are the results? Does it link to any theorem we have proved? Explain.

9. What can you conclude about center of mass of triangle?