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 $\frac{BM}{BY} \cdot \frac{CM}{CX}$ 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?