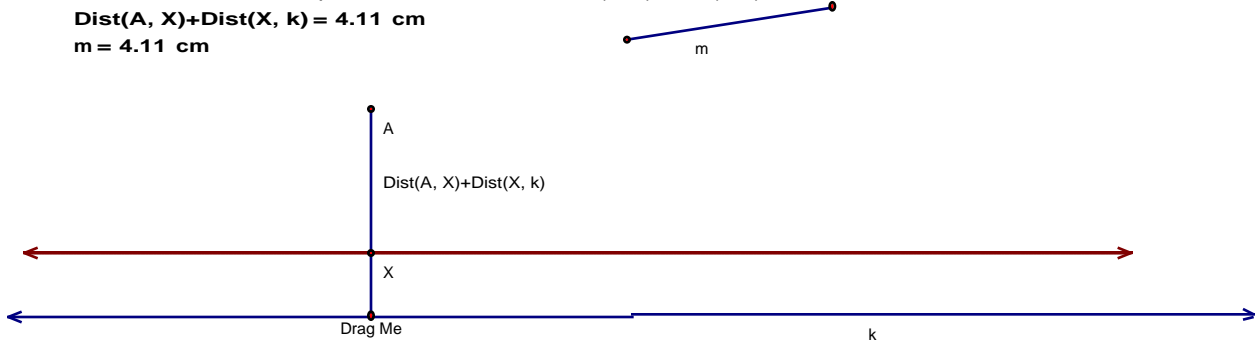


Given: Point A, line k, and a length m
 Construct the locus of points X such that $m = \text{Dist}(X,A) + \text{Dist}(X,k)$.
 $\text{Dist}(A, X) + \text{Dist}(X, k) = 4.11 \text{ cm}$
 $m = 4.11 \text{ cm}$



With the givens, and the goal stated, I assumed that I would get a parabola similar to the one in construction 3. However, through working with the givens, my construction resulted in a locus of points in the form of a line parallel to line k. My construction holds true for the desired goal, however, it was not what I expected to get, and I believe that the fact that $\text{Dist}(X,A)$ did not have to equal $\text{Dist}(X,k)$ resulted in my final construction.

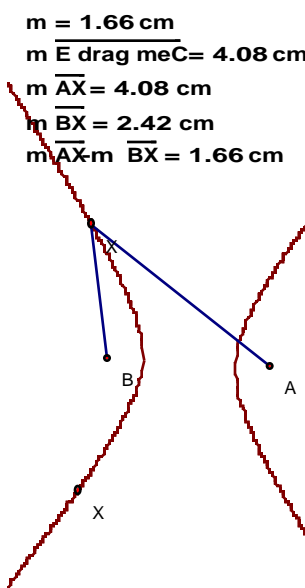
After I displayed line k and length m, I constructed a point on line k and made a circle around that point with length m. Then I constructed a perpendicular line to line k through the point on line k. I then labeled the intersection and called that my point A. I made a segment from point A to the point on the line and constructed a point on that segment called X. Now I had a length m that was equal to the sum of the distances (X,A) and (X, K). Though this construction holds true, it does not seem to apply to a universal set of points A, X, and line k, as points X and A are defined on a perpendicular and are not free of line k.

- 1) The problem with your construction is that the location of point A is dependent upon the location of Drag Me. Were point A free, then when you move Drag Me, it would no longer be true that $\text{Dist}(A,X) + \text{Dist}(X,k) = m$.
- 2) Your explanation does not explain your construction. Why did you do what you did? For example, what was your motive for "constructing a point on line k and making a circle around that point with length m"? What was your overall strategy?

Given: Point A, point B and a length m
 Construct the locus of points X such that the $m = \text{Dist}(X,A) - \text{Dist}(X, B)$. That is, construct the locus of points such that m is the difference of any point's distances from A and B.



$m = 1.66 \text{ cm}$
 $m \text{ E drag me} = 4.08 \text{ cm}$
 $m \overline{AX} = 4.08 \text{ cm}$
 $m \overline{BX} = 2.42 \text{ cm}$
 $m \overline{AX} - m \overline{BX} = 1.66 \text{ cm}$



First you display the givens on GSP. The givens are what you are basing your whole construction off of. Remembering back to my Algebra II class, I remember that the idea behind the construction you are trying to create implies that you are trying to create a hyperbola. If you want the set of all points X that are related to the givens in that $m = \text{Dist}(X,A) - \text{Dist}(X,B)$, I could see that a hyperbola is defined by such a construction.

So, we construct a segment of length m and create a line that contains segment CD of length m. Put a point on line m that is to the right of point D of segment CD.

From point D and the point E, we construct a segment so that we may have a segment of length BX. From the left endpoint to the point that is to the right of the right endpoint, we construct a segment that is of length AX. Thus the segment m is equal to the difference between the distance from point A to point X and the distance between point B to point X.

Now we want to create a circle by center+radius around the point A that has the radius of segment CE. We create a circle by center+radius around B of radius=DE. Thus, segment CE=segment CD+segment DE as long as E is not moved along the line m to the left past point D. If segment CD is of length m, then the length of segment DE plus m should equal the length of segment CE and segment AX. By clicking on points A, X and E, we can construct a locus of points that are any X such that $\text{Dist}(A,X) - \text{Dist}(B,X) = m$. The only problem with the construction is that if you drag point E to the right of point D, the $\text{Dist}(X,B)$ becomes negative and the construction no longer works. So, as long as E is on or to the right of point D, the construction is golden and has no flaws. Also note that point X is the intersection between the circles with center A and center B. So if those circles are moved away from each other to where the circles no longer intersect, then X disappears. However, if you move the centers of the circles away from each other, the length of the circles' radius must increase so that the circles continue to intersect. If these concepts are maintained, then this construction holds true for all points A, X, B taken respect to any length m.

This construction is correct, but your explanation is much closer to a Type I explanation (saying only what you did) than a Type II explanation (which puts the focus on your overall strategy and motivation for each step).

Also, please construct your explanation as an MS Word document, pasting your sketches as diagrams and composing your prose around it. Finally, you might consider including intermediary diagrams or using arrows to indicate the parts of a diagram to which a segment of prose refers.