Locus Construction 3

In the applet below, A is the center of the circle, B is a point outside the circle, and C is a point that lies on the circle.

1) Construct a ray with endpoint A that passes through C.

2) Construct the perpendicular bisector of BC.

3) Construct the point of intersection of the ray and segment you constructed in (1) & (2) above. If necessary, right click on this point and rename it D.

4) Right click on this point D. Select Trace On.

5) Select the Move arrow. Now, drag point C around the circle and watch the trace of D. What does this trace look like?

6) Move point B to a different location. Clear the trace. Repeat step (5). What does this trace look like?

7) Clear the trace once more. What can you conclude about the distances CD and BD? (If you're totally stumped, feel free to measures these distances.)

8) What previous theorem justifies your observation in (7) above? (Don’t just “name it”. Write it out in words!)

9) Fill in the blank to make a true statement:

Since the radius of a circle never changes, it is said to be ____________________.

Thus, we can say that the value AD – CD is ________________.
10) Given your results for (7) & (9), what can you conclude about the value $AD - BD$?

11) How would you describe the pink locus (set of points that meet a certain condition) in the applet below? That is, how can you geometrically define the term you wrote as a response to (5) and (6) above?