Name: ___________________________________

Locus Construction (III)

You'll need the following materials for this activity:

1 piece of wax paper
Compass
Pen/Pencil

1) On your piece of wax paper, use your compass to construct a fairly large circle. (Be sure to make the radius small enough so that the entire circle is contained on the wax paper.

2) Plot and label the center point of your circle. Label this point *A*.

3) Plot and label another point in the **exterior** of this circle. Label this point *D*.

4) Plot approximately 25-30 points *on the circle*. (Just draw dots to represent these points). Label *any one* of these 25-30 points as *B*.

5) Take the wax paper and fold it so that point *D* lies on top of point *B*. Crease sharply.

6) Repeat step (5) above for all the other points on the circle. That is, treat each point on the circle as point *B*. Simply fold point *D* on to each point "*B*" on the circle. Crease sharply each time.

7) Take a look at the wax paper. What do you see? Describe as best you can.

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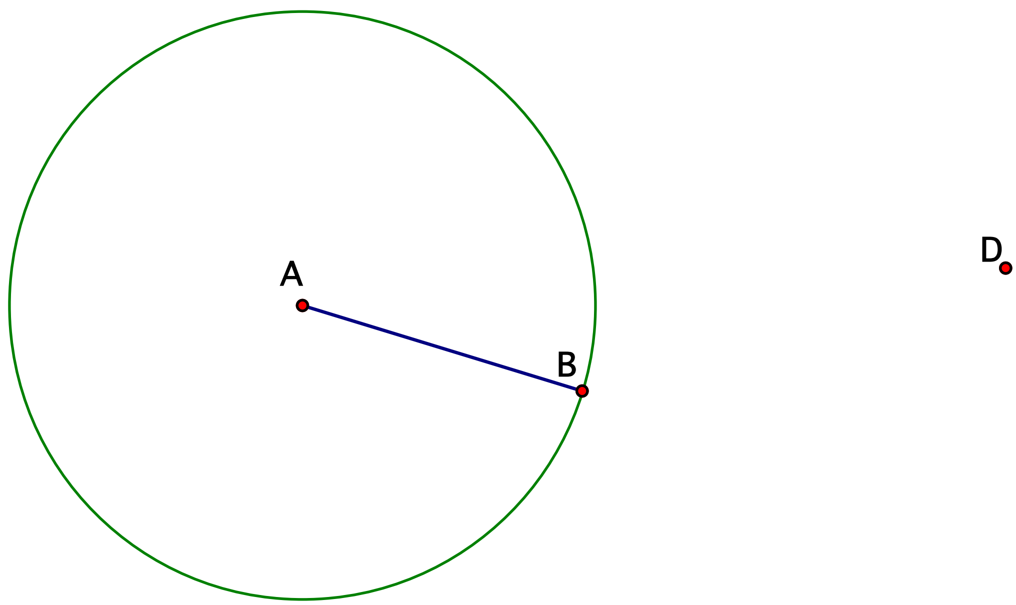
8) Let's analyze this again. Consider the following diagram below. Fold point *B* onto point *D* just one more time.



9) This fold line is called the ___________________________ _______________________ of $\overline{BD}$.

10) Every point on this ___________________________ _______________________ of $\overline{BD}$

is _______________________ from points ________ and ________.

11) Use your ruler to construct ray $\overrightarrow{AB}$. Draw as much of this ray as will fit on the paper.

12) Label the point at which the fold line intersects $\overrightarrow{AB}$ as ***H***.

Did you know that Point H is actually a point that lies on the curve that you generated through the paper folding activity on the previous page? It does. So what's so special about all these point H's that lie on the curve you generated on the wax paper? Let's find out:

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

Since the radius of a circle is always __________________ *we can conclude that radius*

$\overline{AB}$ *(which has a length denoted as AB*) is __________________________. But wait!

AB = ________ - ___________ (made obvious from the diagram).

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Since point H lies on the ____________________ ________________ of _________, we

can conclude that _________ = _________ due to what was expressed in (10) above.

Since AB = ________ - __________ *is always a ___________________ value, we can*

conclude, upon simple substitution, that ***the value*** _______ **-** _______ ***must always***

remain ________________ ***as well!***

The bold phrase in the sentence above applies for every point *H* that can be generated through this paper folding process described above!