Materials

- Two pieces of 8.5 x 11 inch paper

- Writing utensil

- Scissors

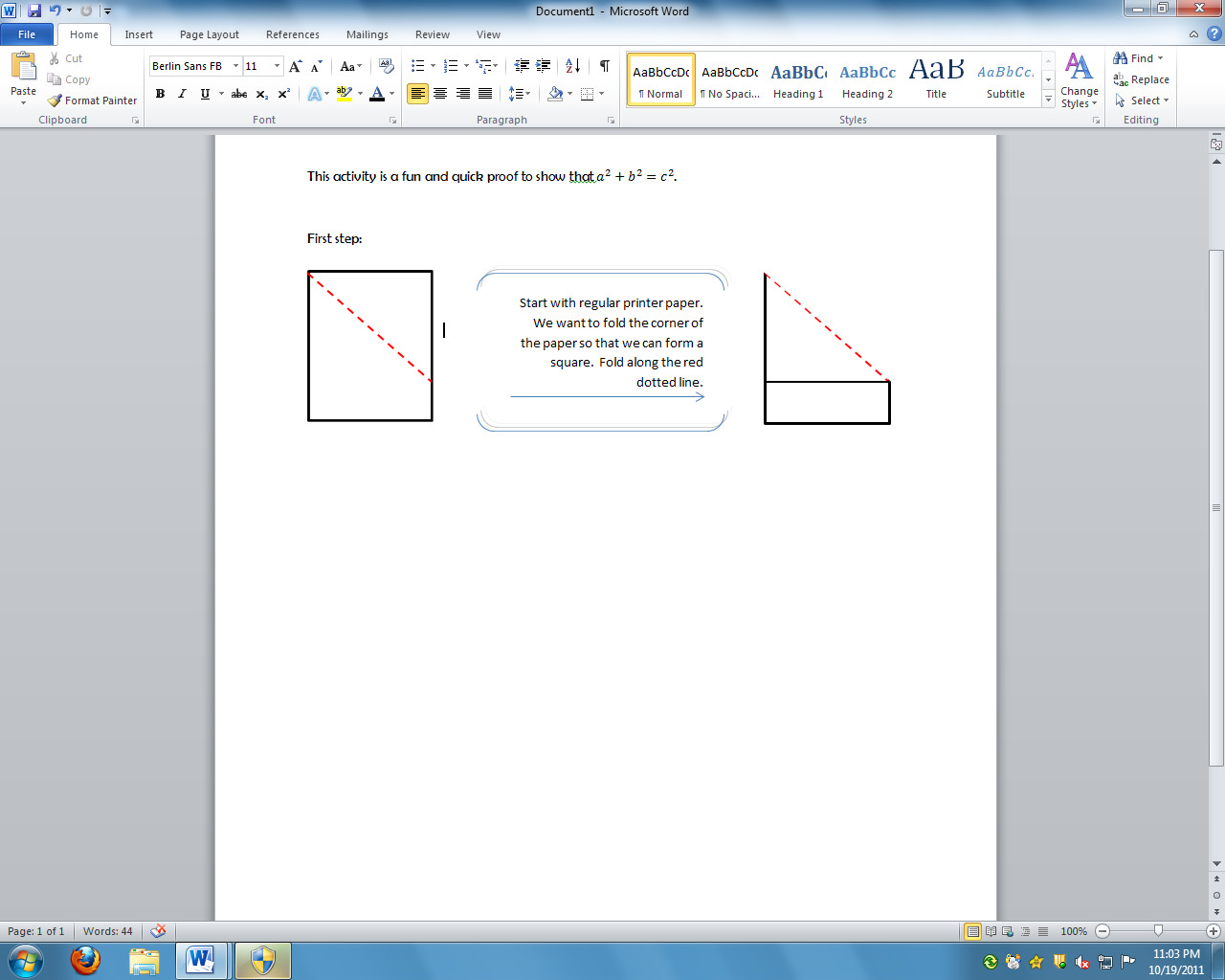
**Contacts**

* Sherri Maine: [smaine@fredonia.edu](mailto:smaine@fredonia.edu)
* Stephen Kirsch: [skirsch@fredonia.edu](mailto:skirsch@fredonia.edu)

Fold paper so that is lined up along . The fold should look something like the red dotted line segment .

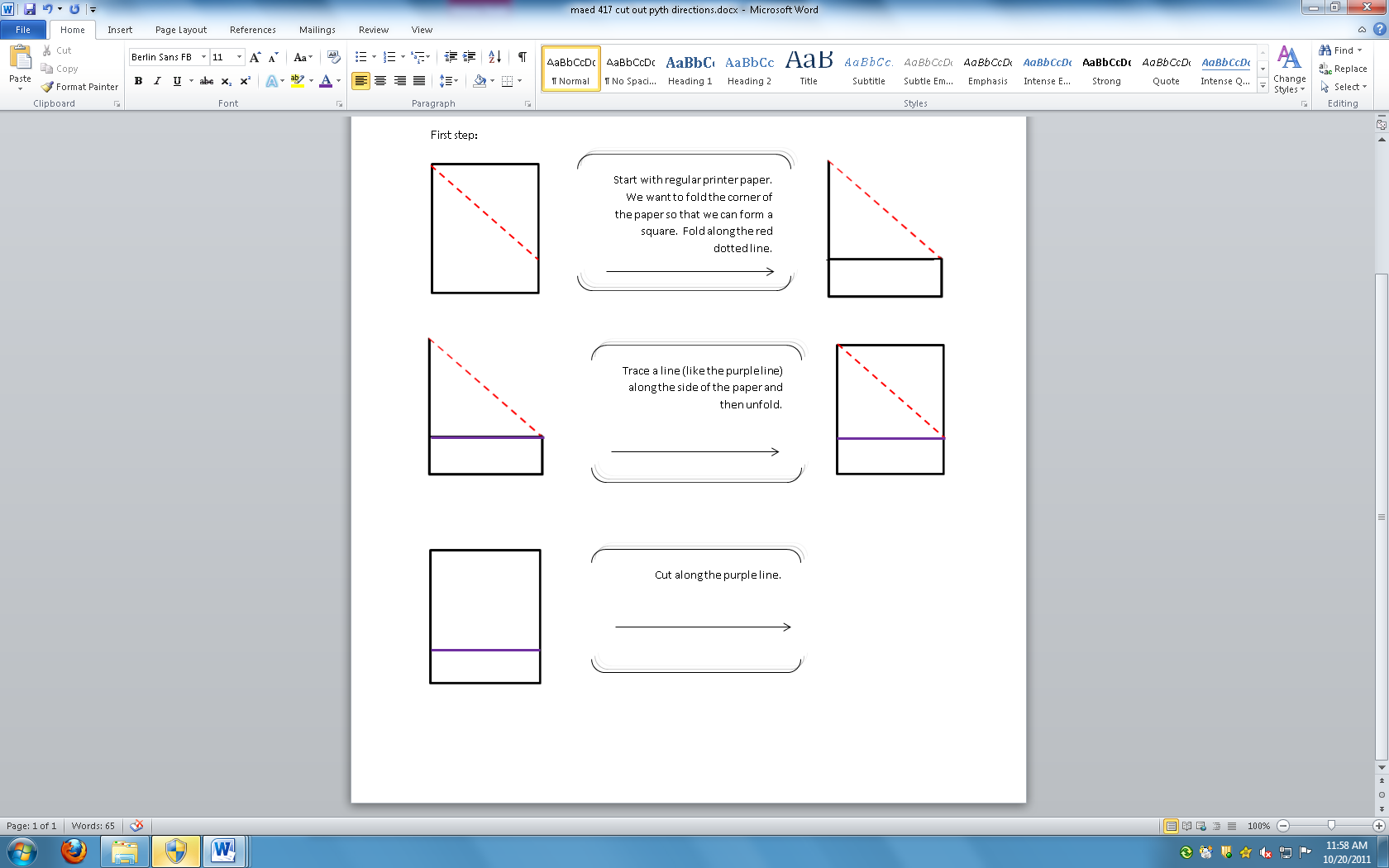
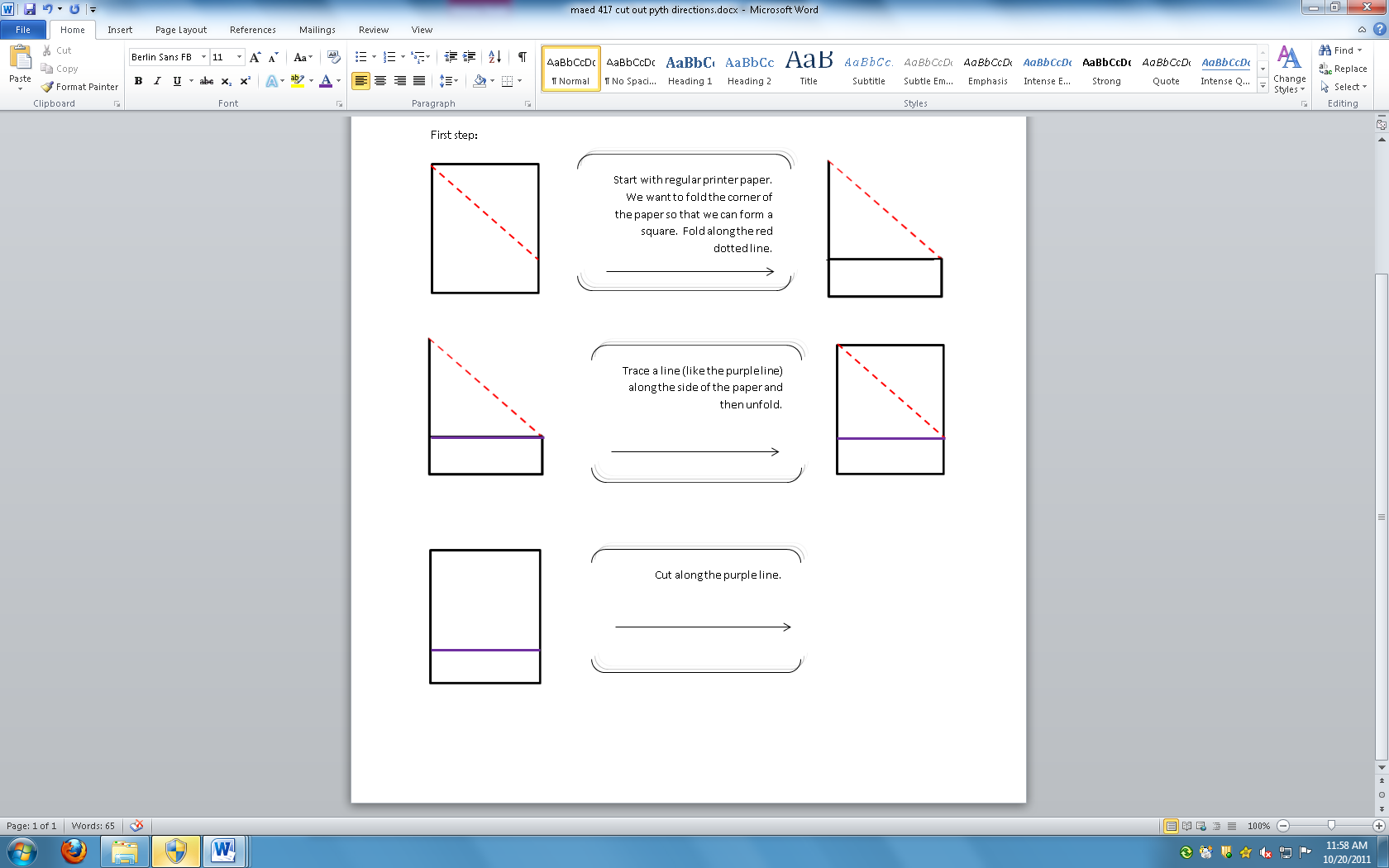
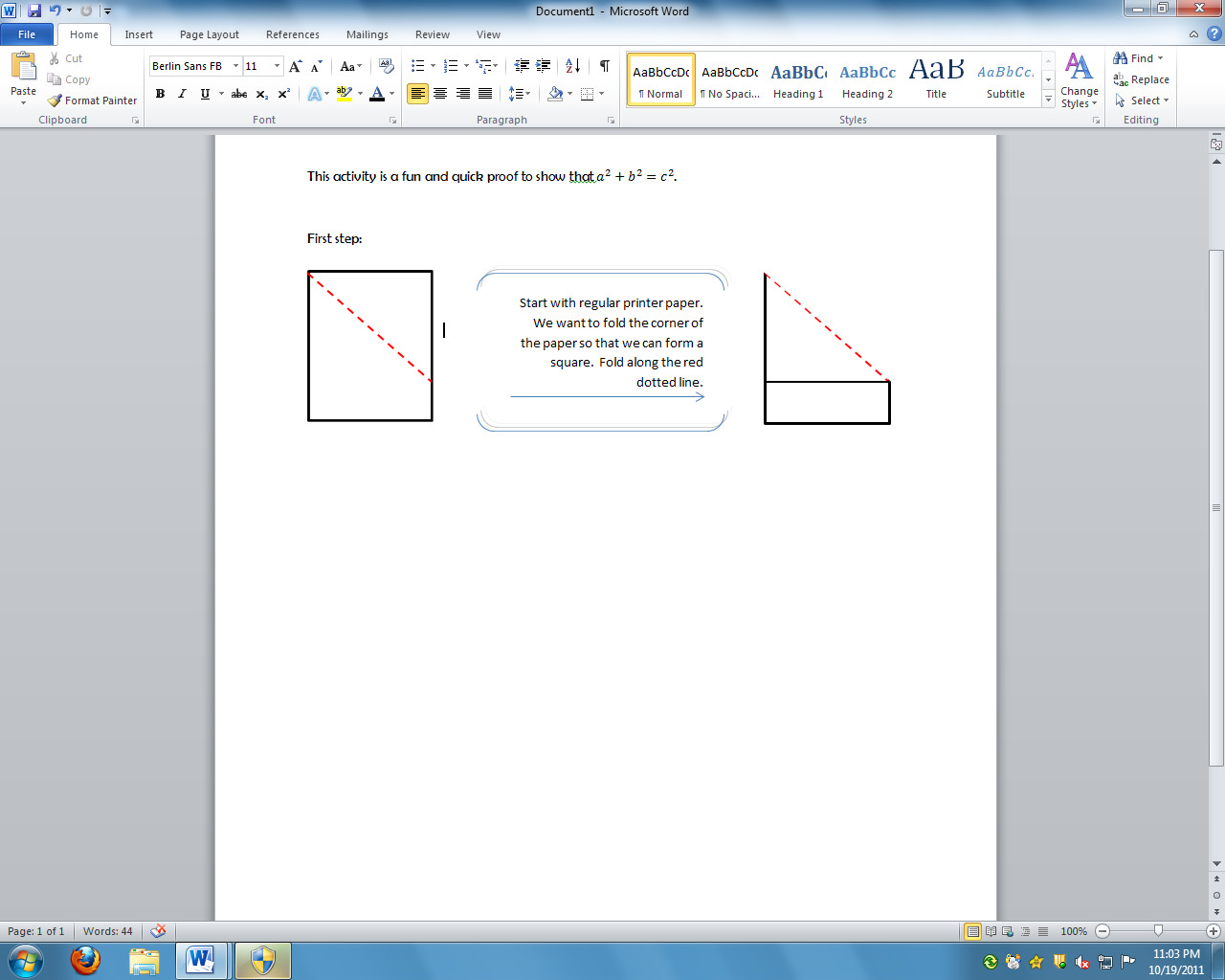
# Cut Out Proof!

Fun, hands-on activity that provides a concrete way to prove Pythagorean Theorem



**APPLY TO BOTH PIECES OF PAPER**

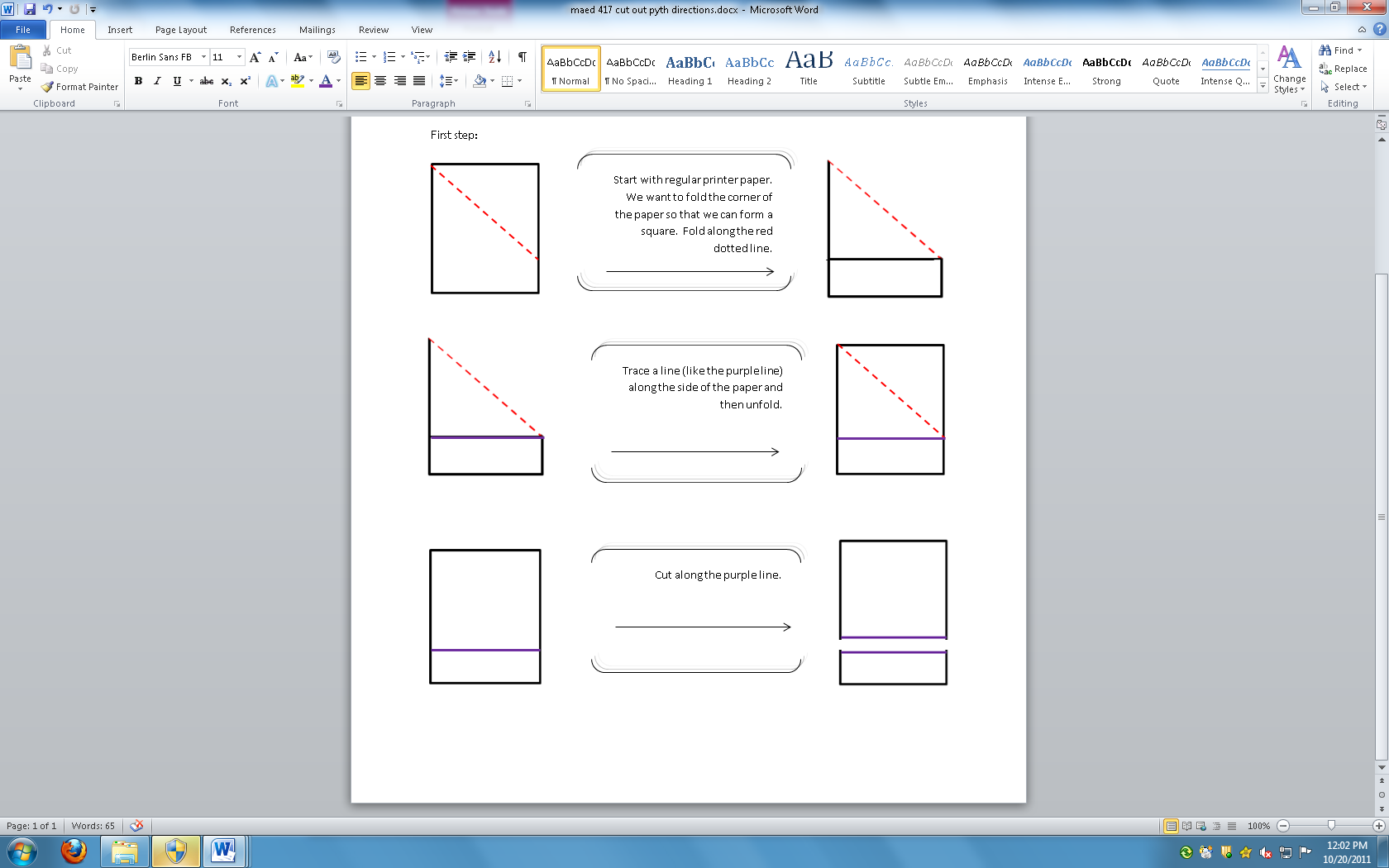
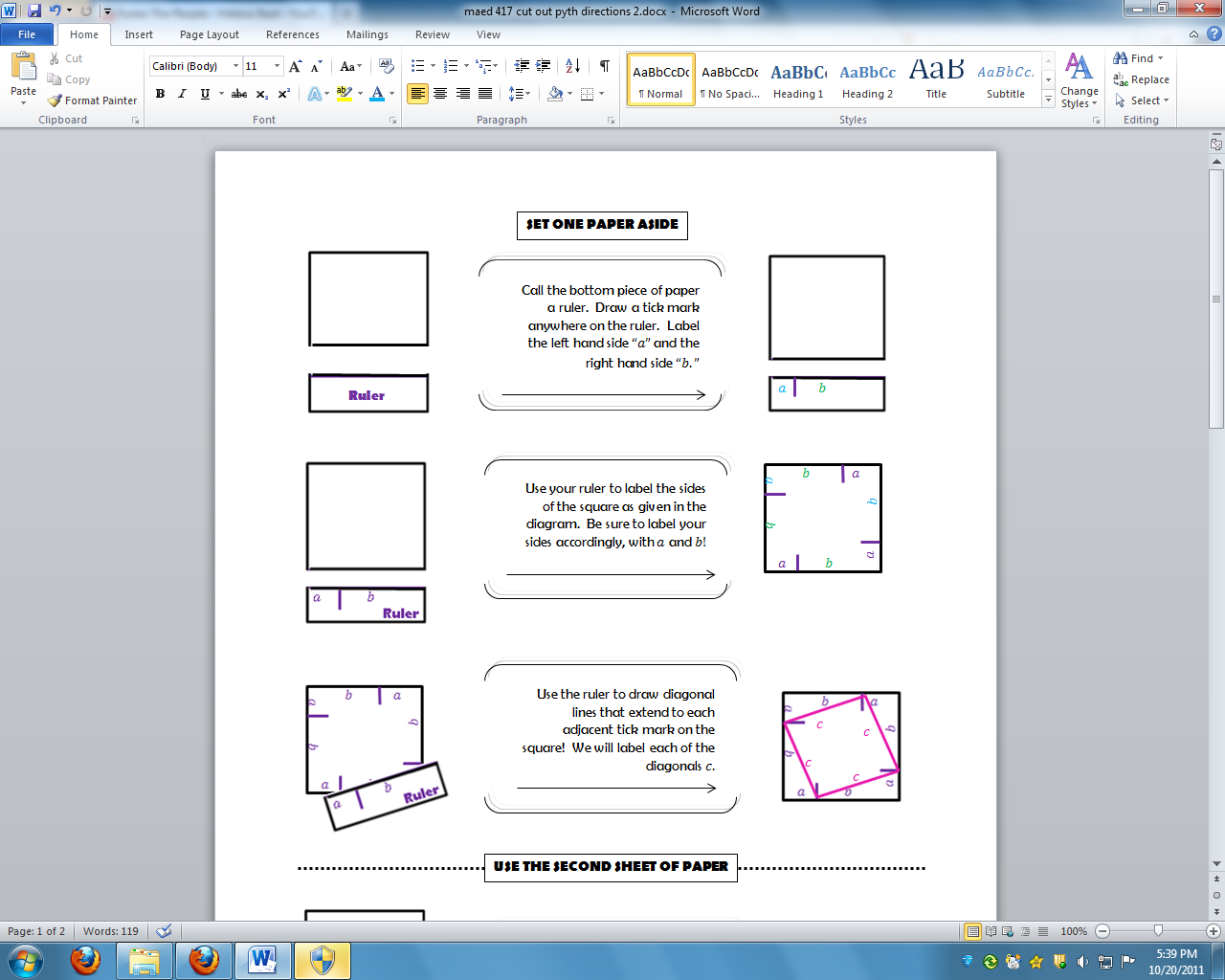
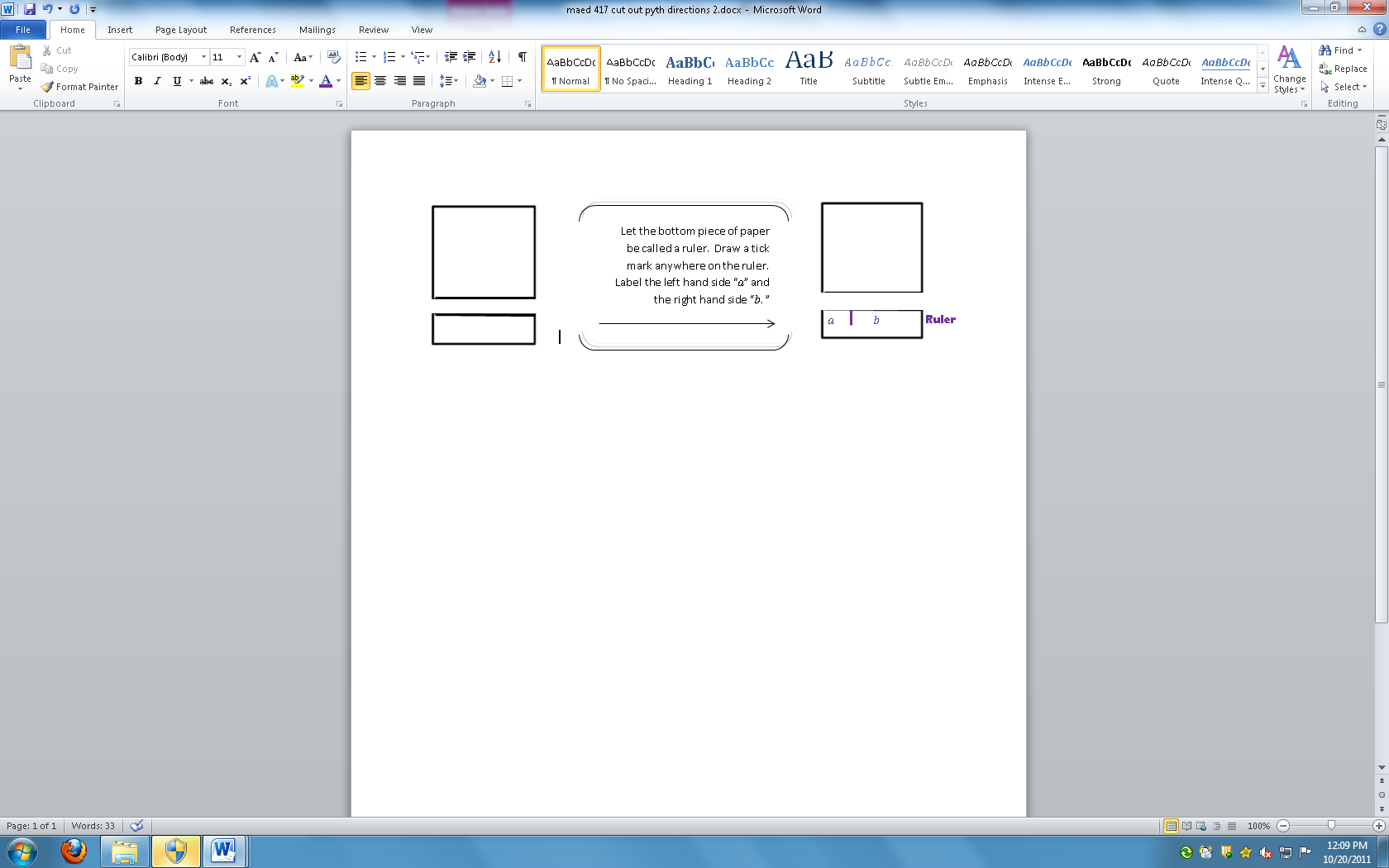




Trace along with a writing utensil as shown in purple in the diagram. Unfold the paper.

Cut along .

Note that the figure is a square.



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Use your “ruler” to label the sides of the square as given in the diagram. Be sure to label your sides accordingly, with and

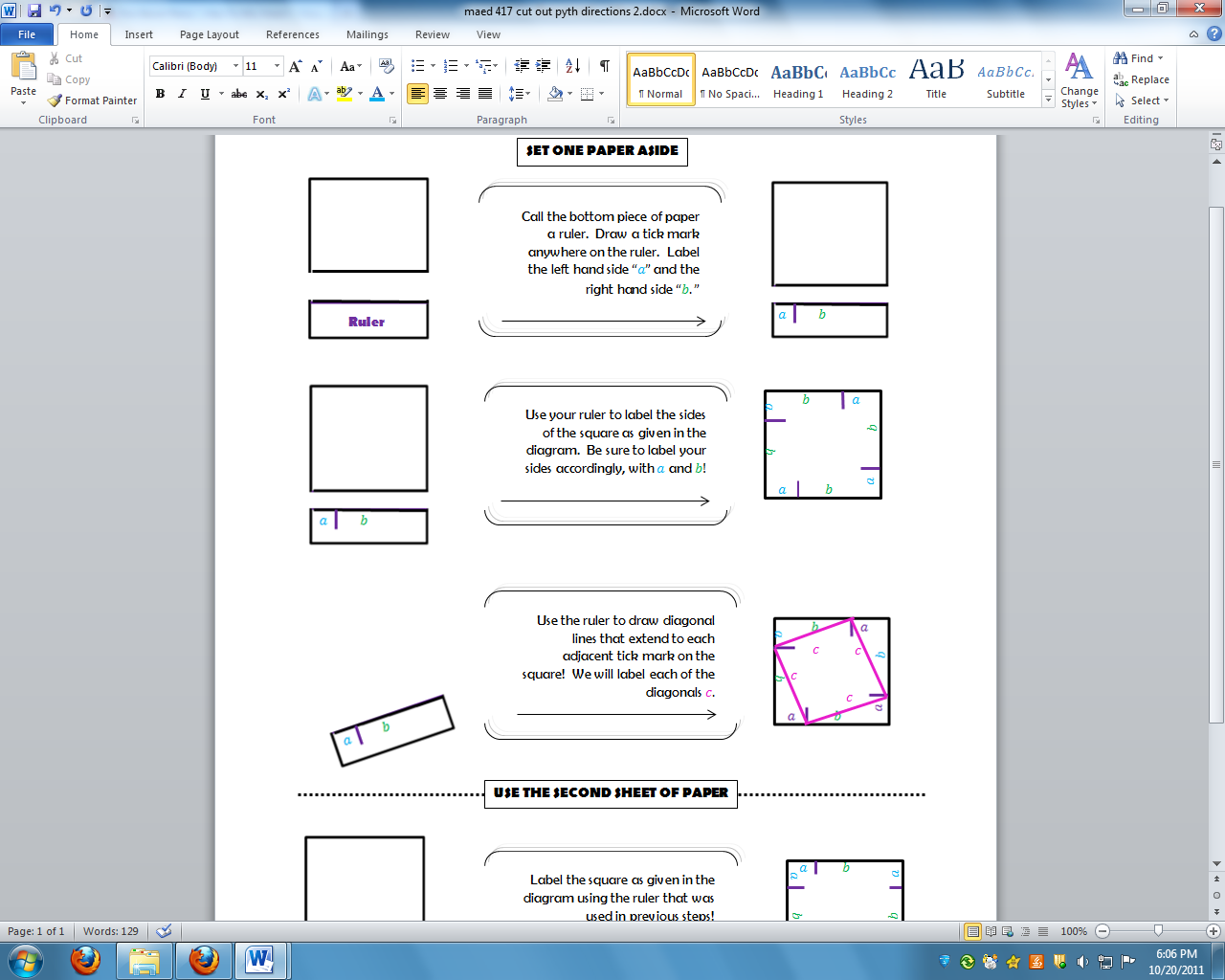
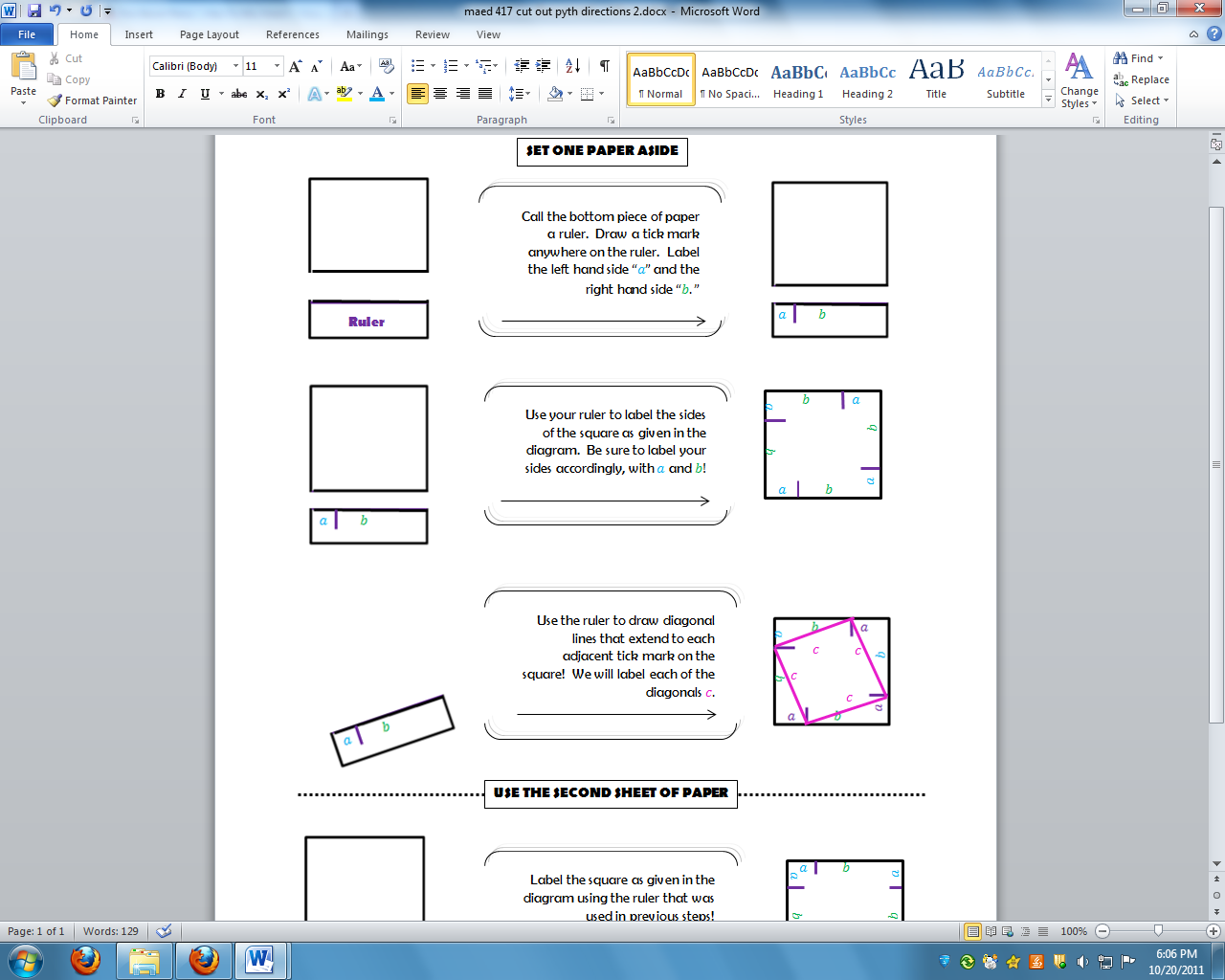
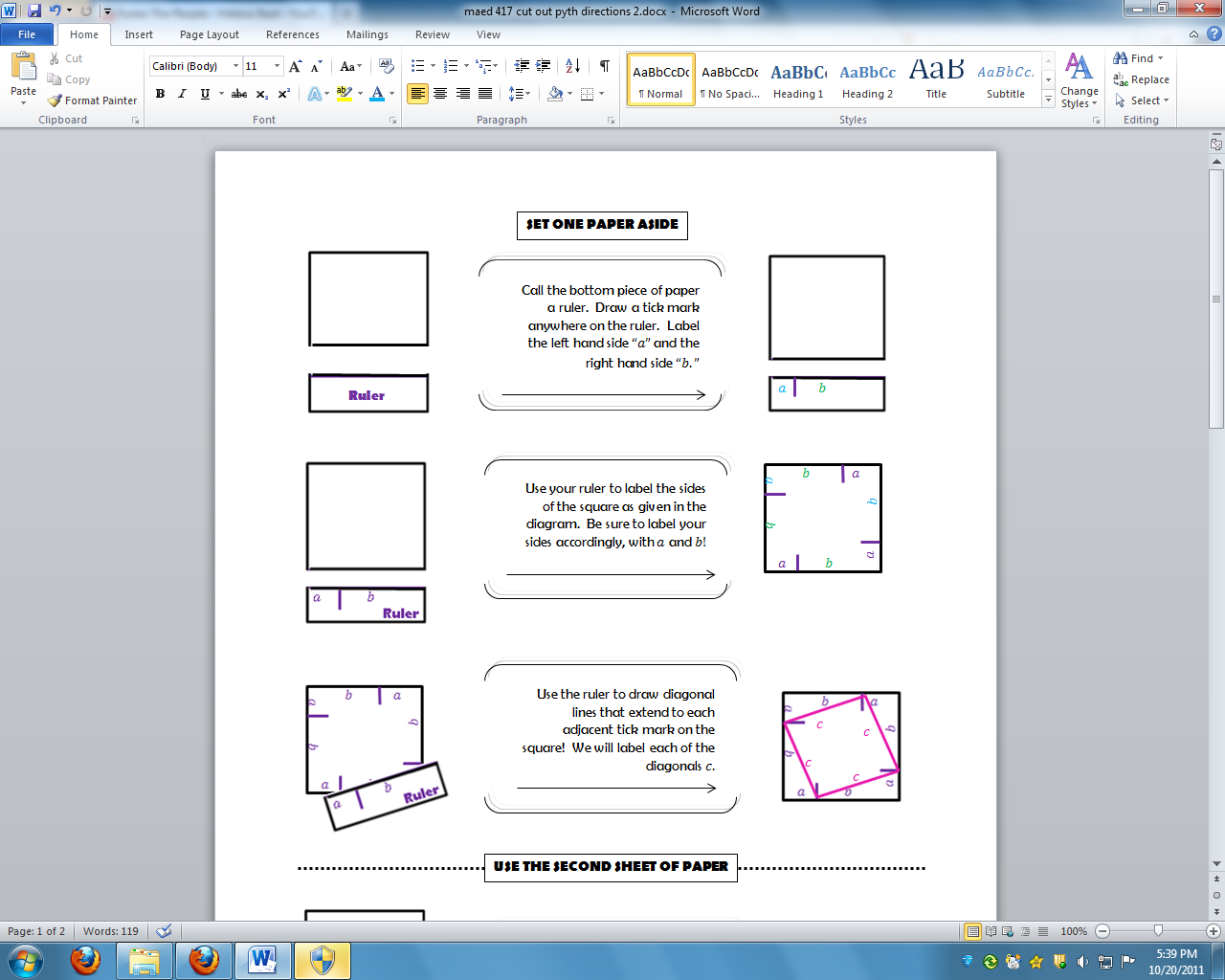
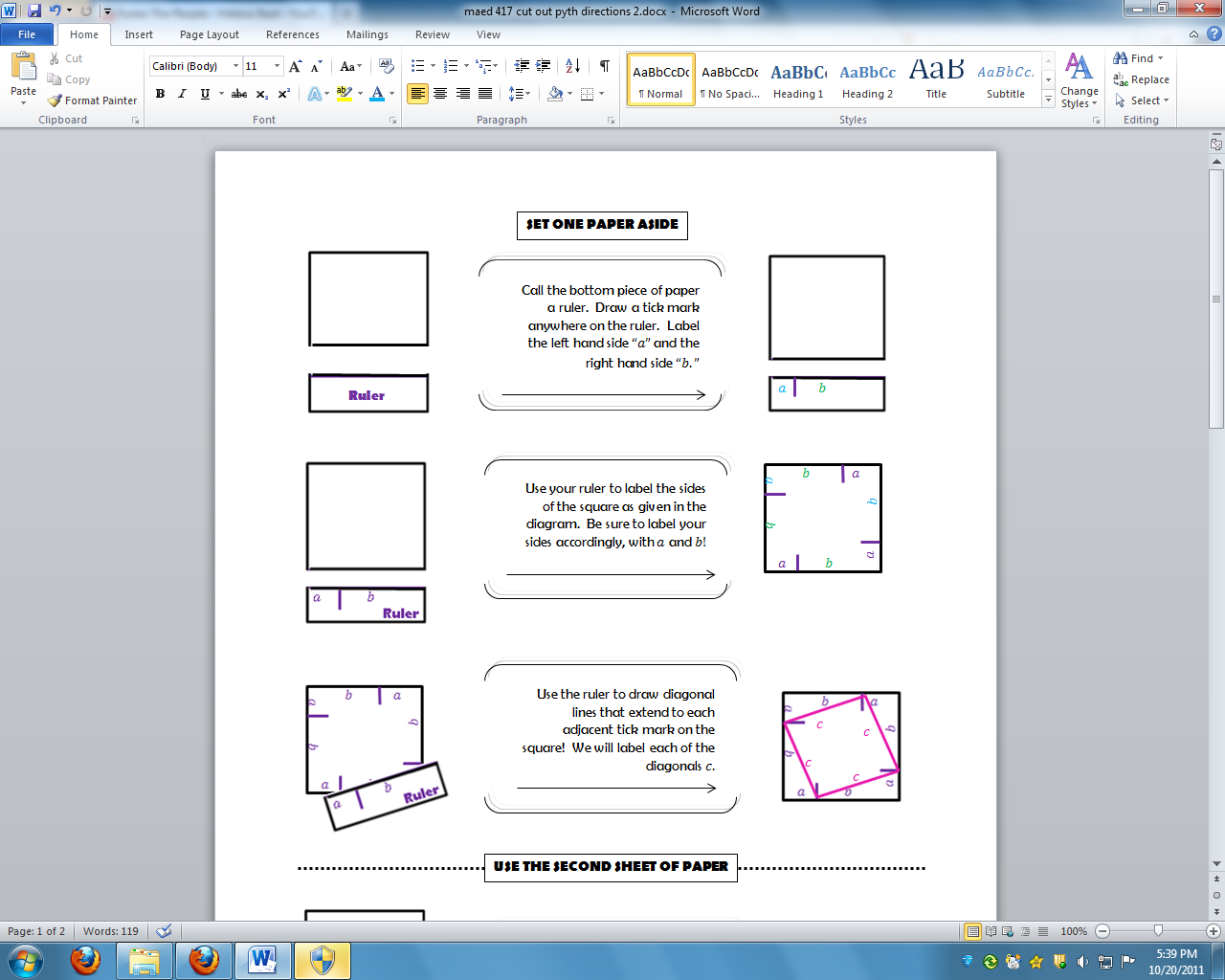
Label the square as given in the diagram using the “ruler” that was used in previous steps!

**USE THE SECOND SHEET OF PAPER**

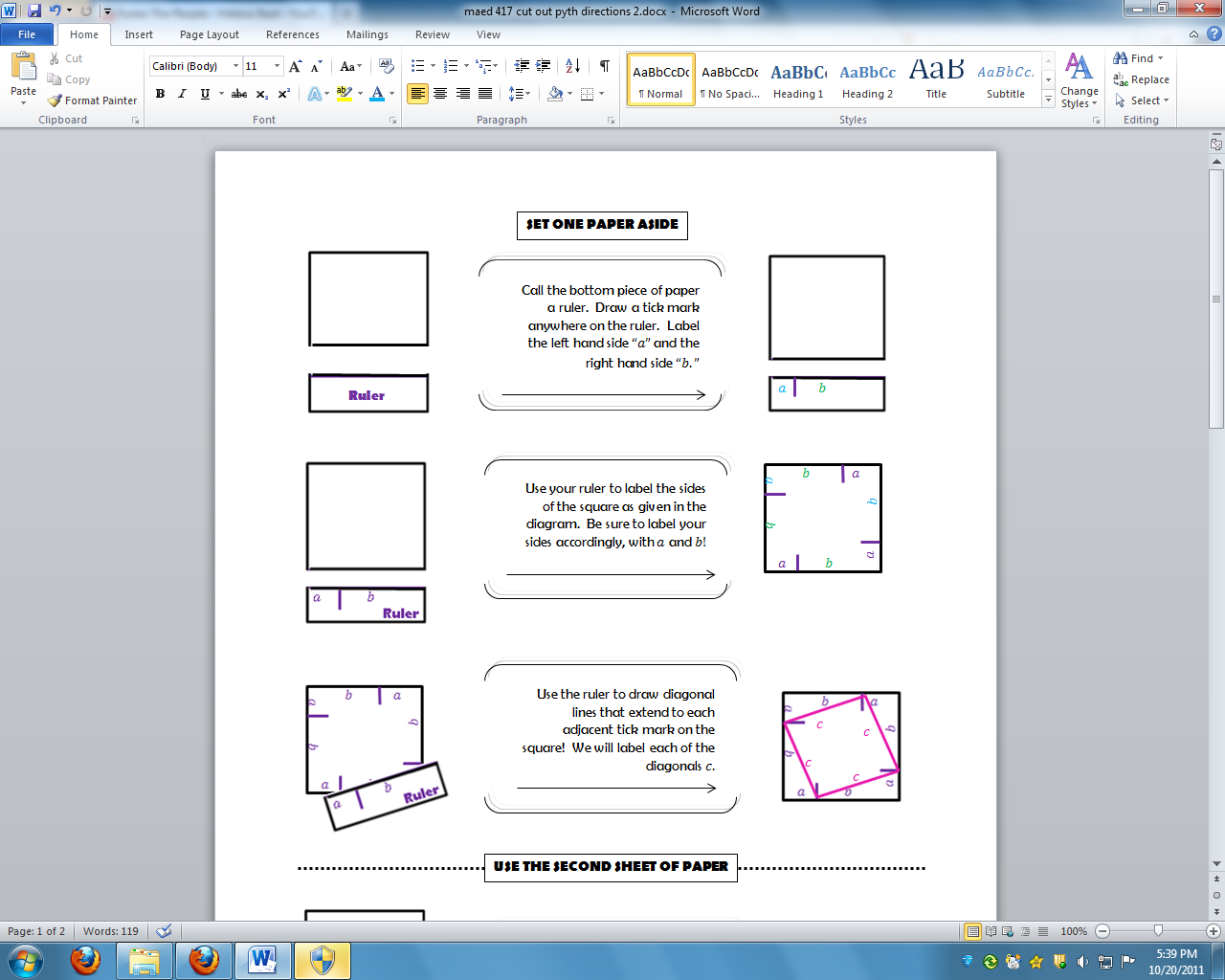
**SET ONE PAPER ASIDE**

We will call a “ruler.” Draw a tick mark, , anywhere on . Label , , and

**Ruler**



Use the “ruler” to draw the following line segments: . We will label each of the segments

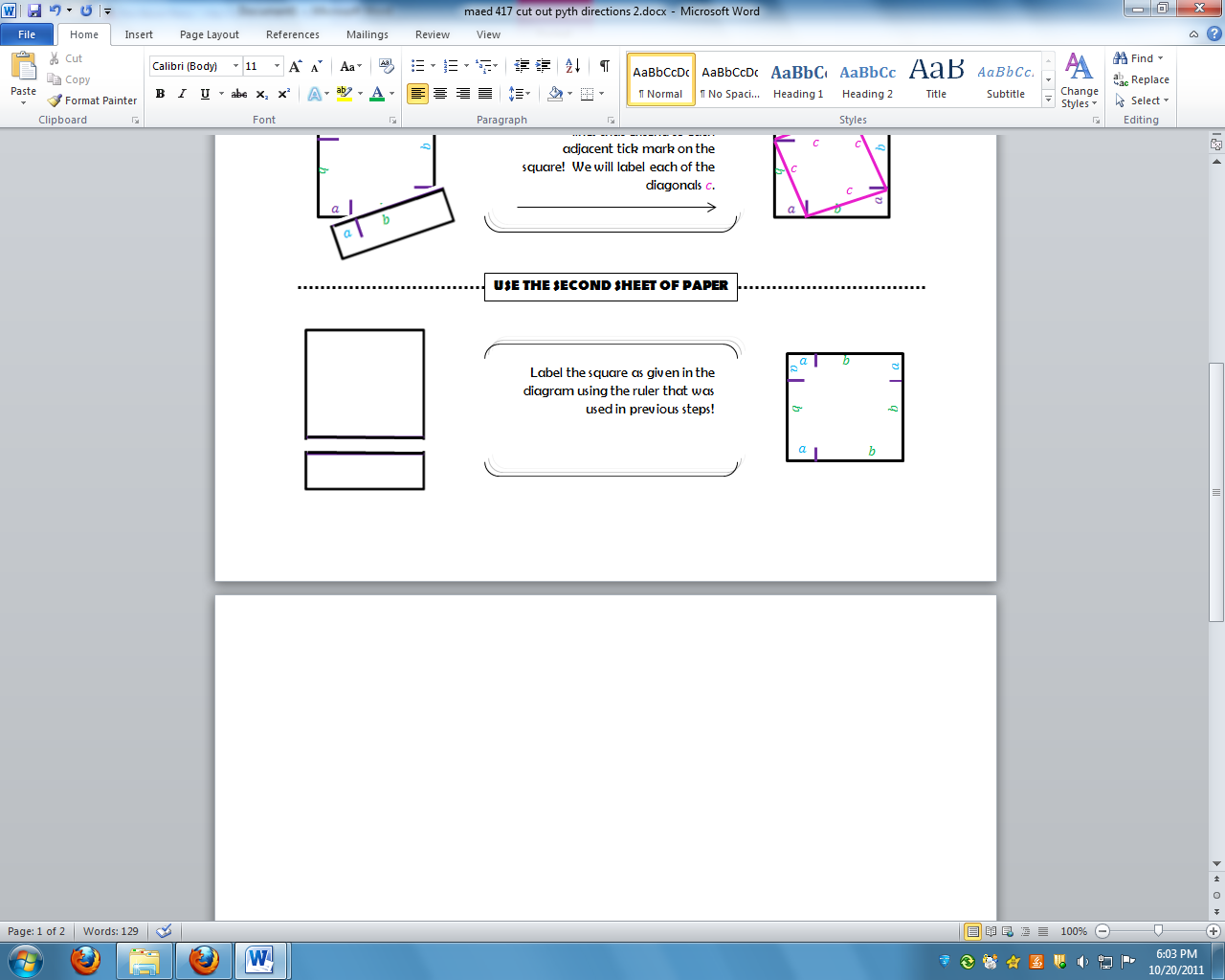
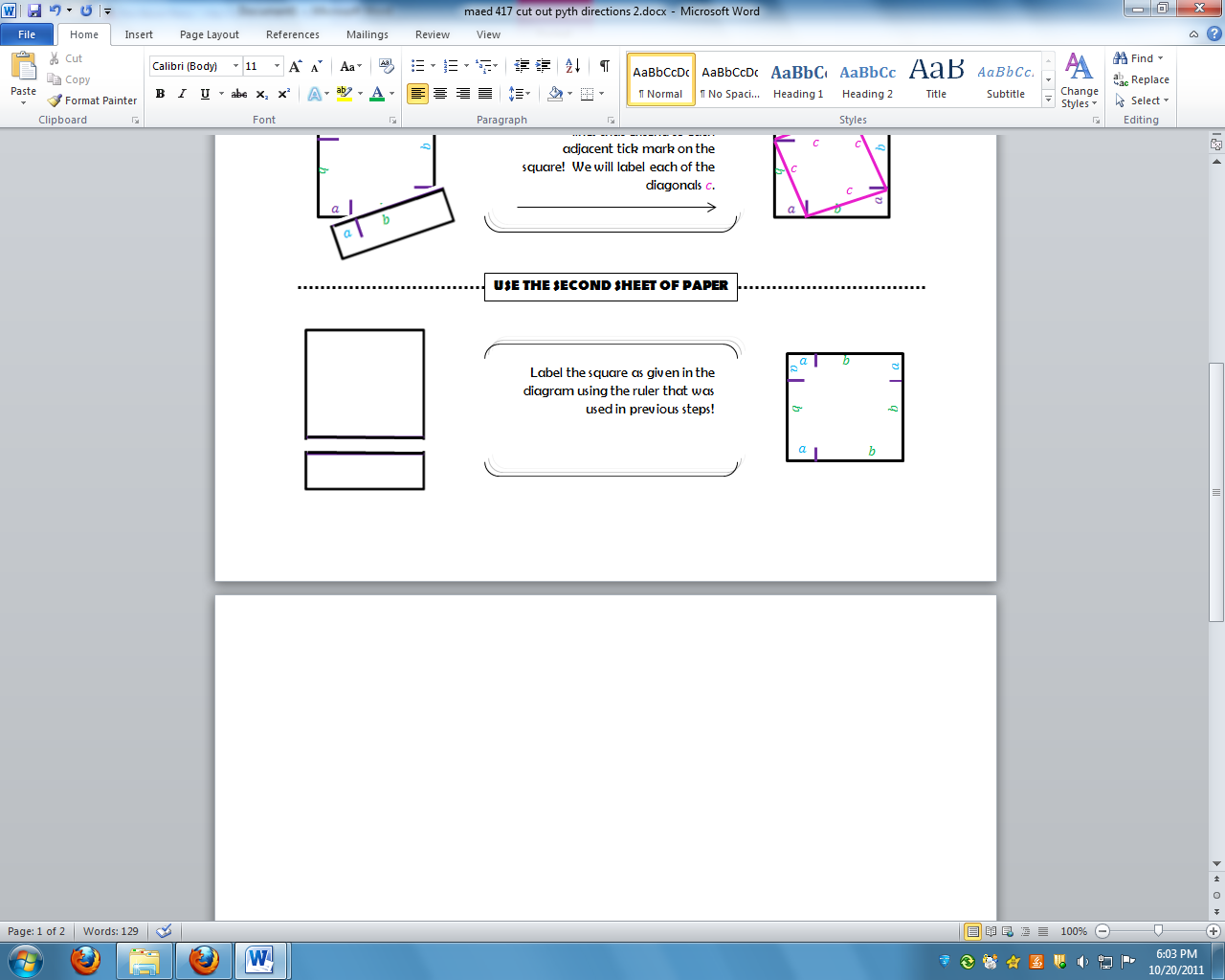


**Contacts**

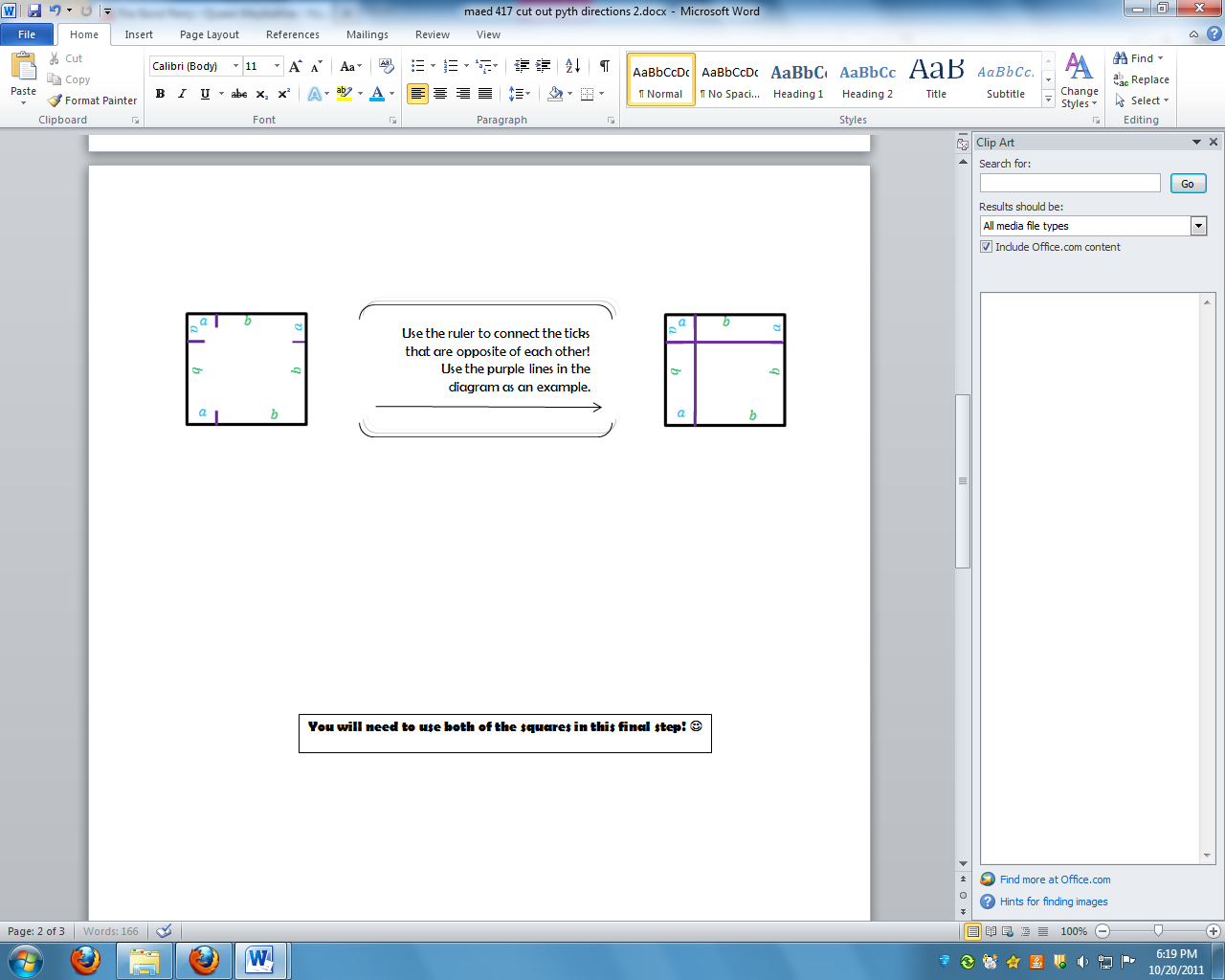
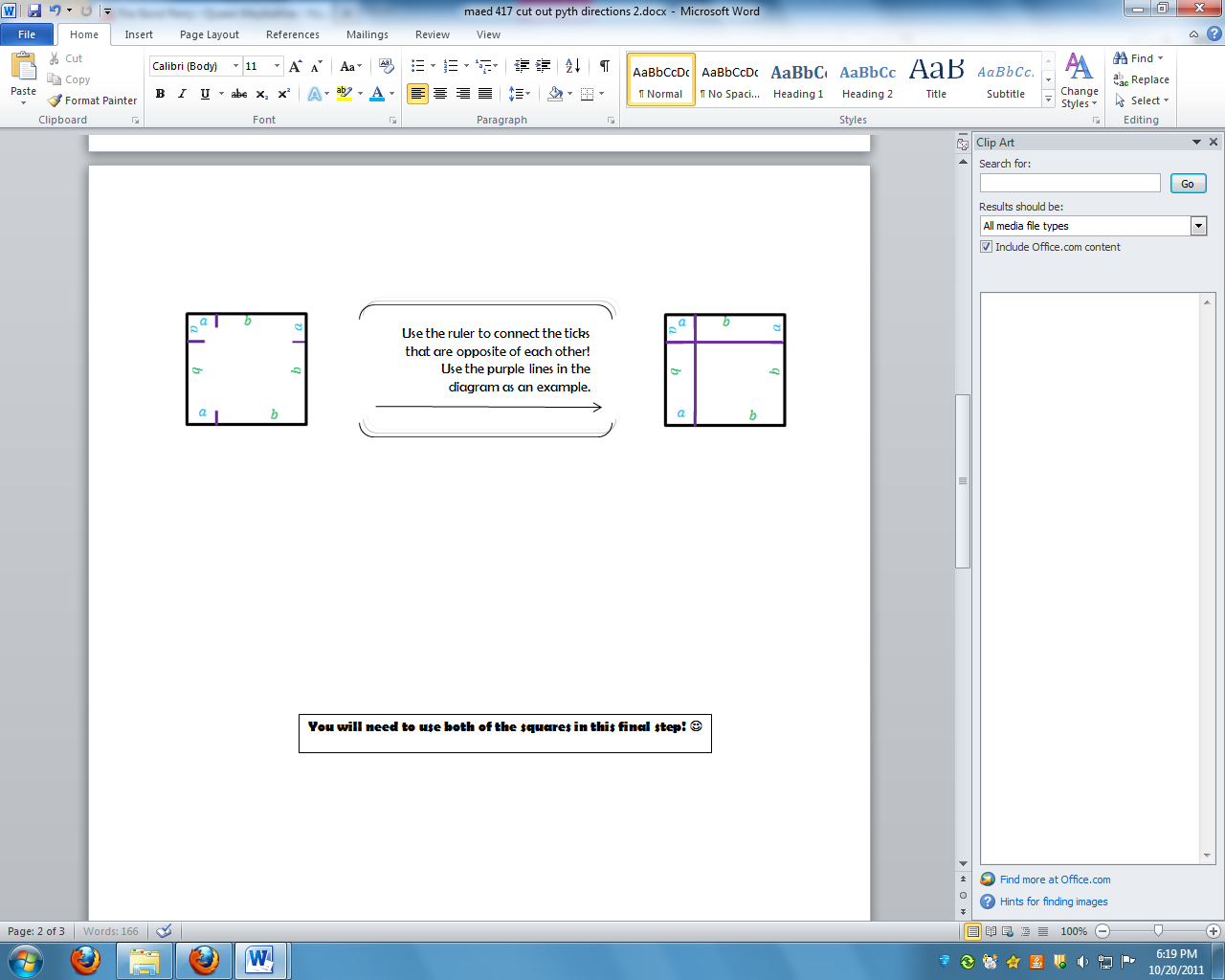
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Use the “ruler” to form the segments and .

Let be the point of intersection of the segments.



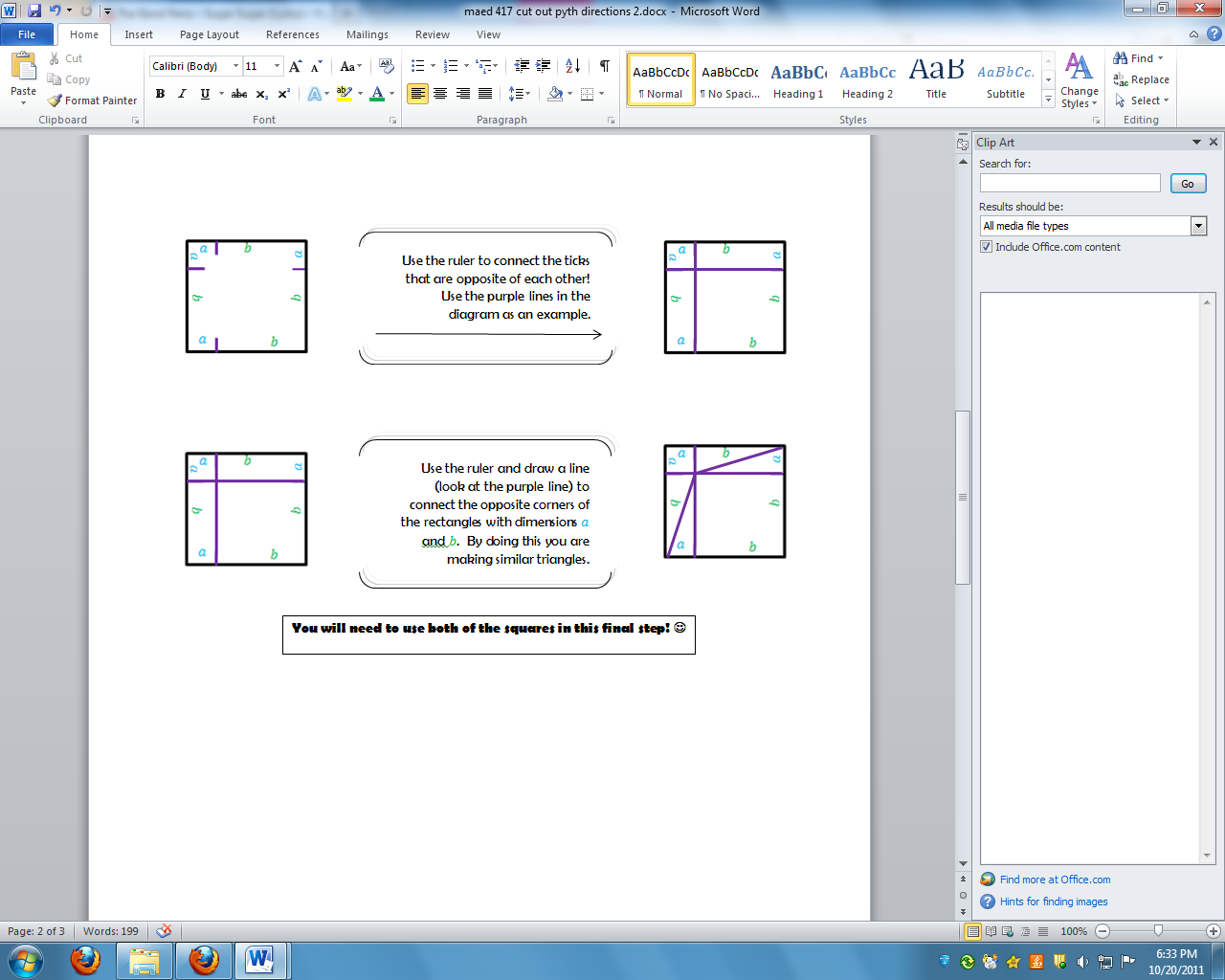
Use the “ruler” and draw segments and .

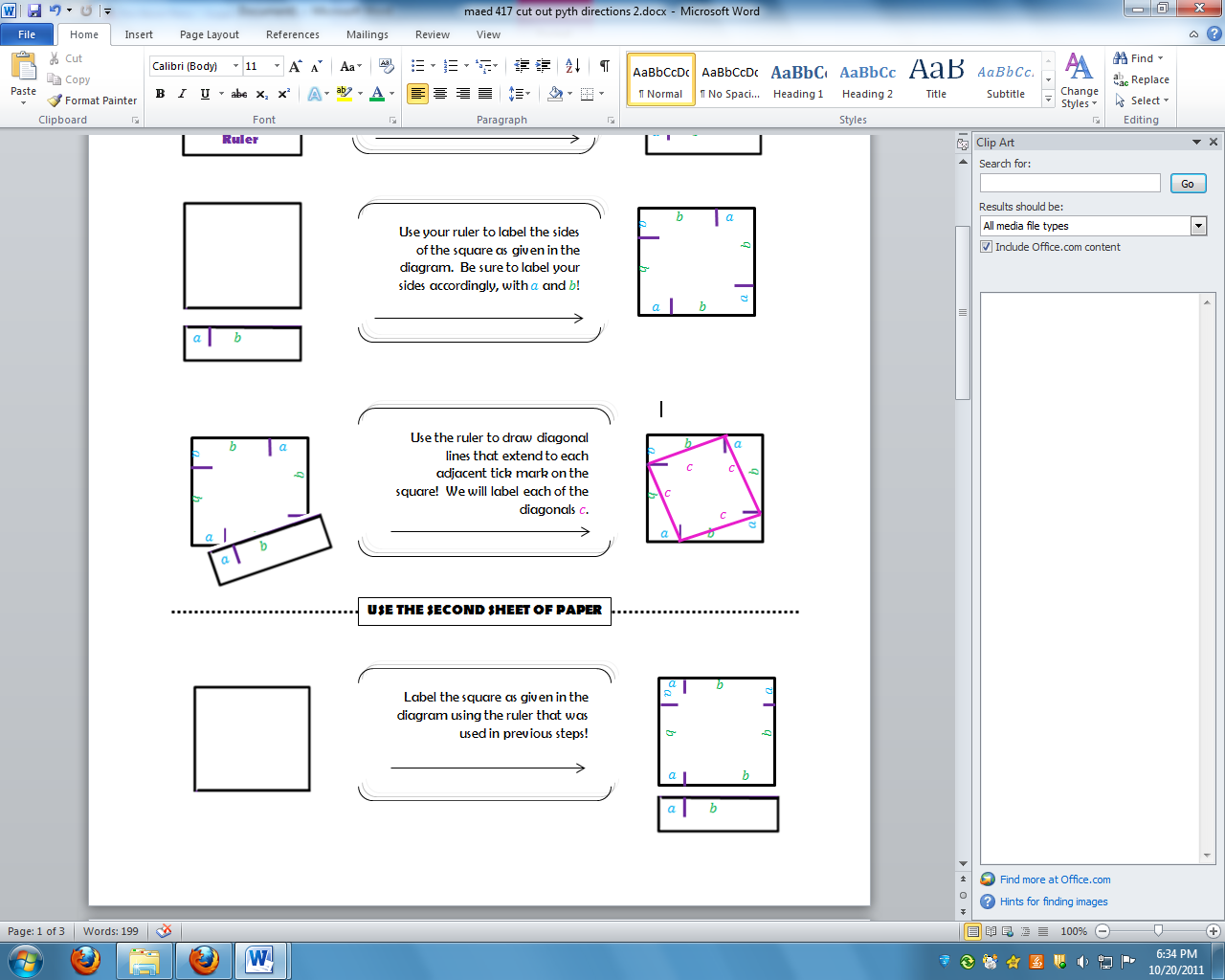


Starting out the total areas of the squares are equal!

Now cut two triangles from each square.

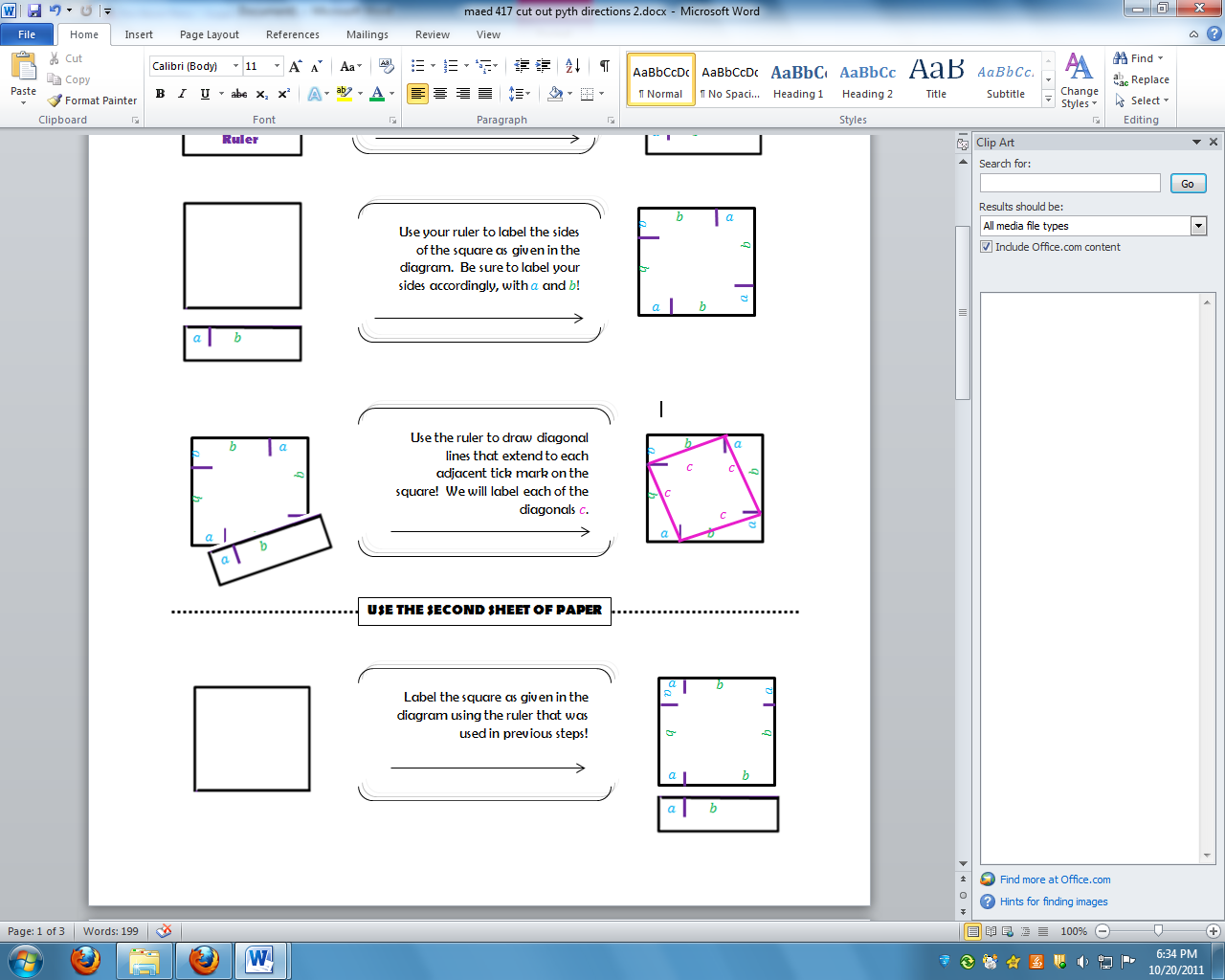
**You will need to use both of the squares in this final step! ☺**

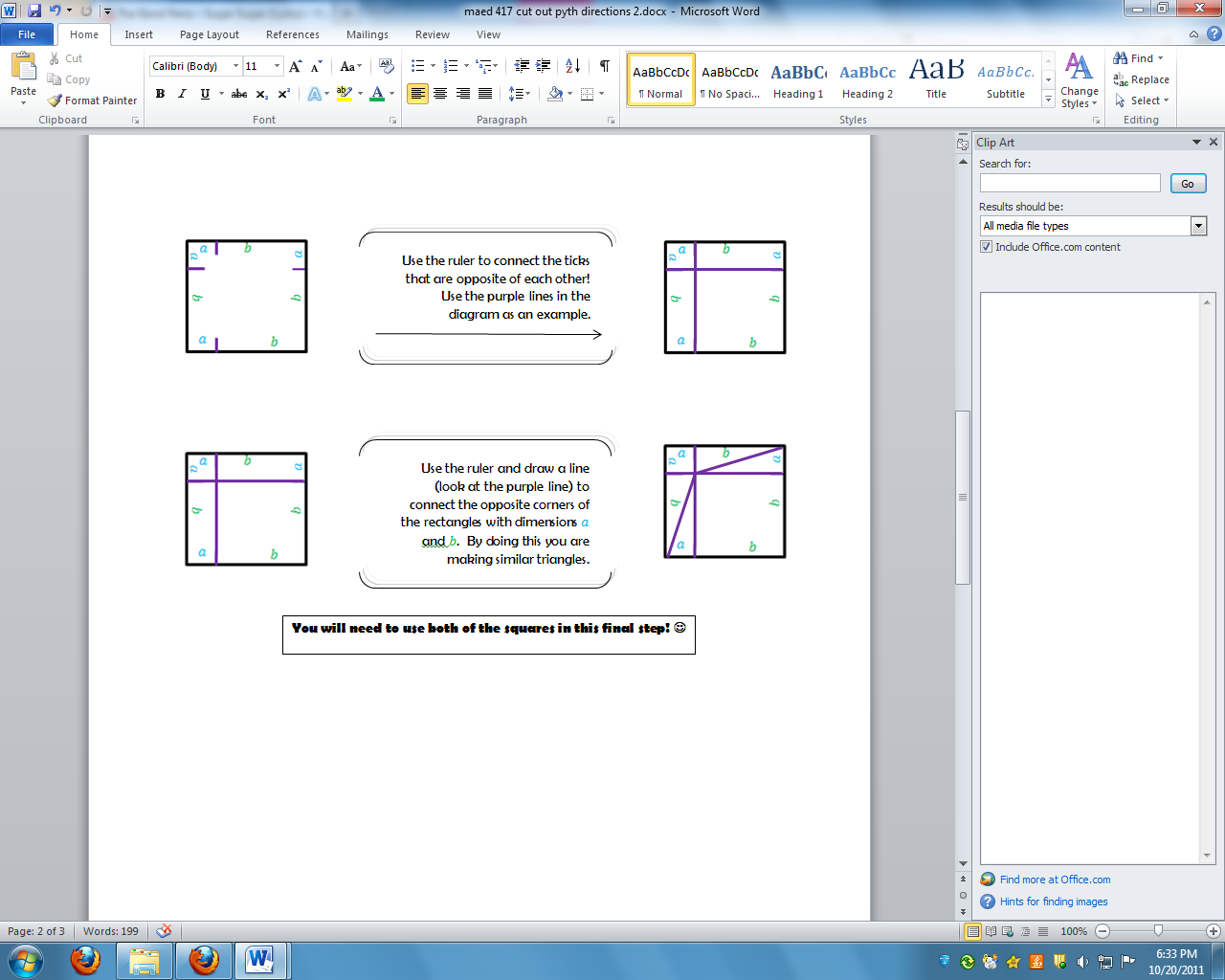




The areas between the shapes are the same even after cutting out two triangles. Compare the area of the triangles that were cut out. They are the same! We started with the same area and subtracted the same amount of area. Therefore we are left with the same amount of area!

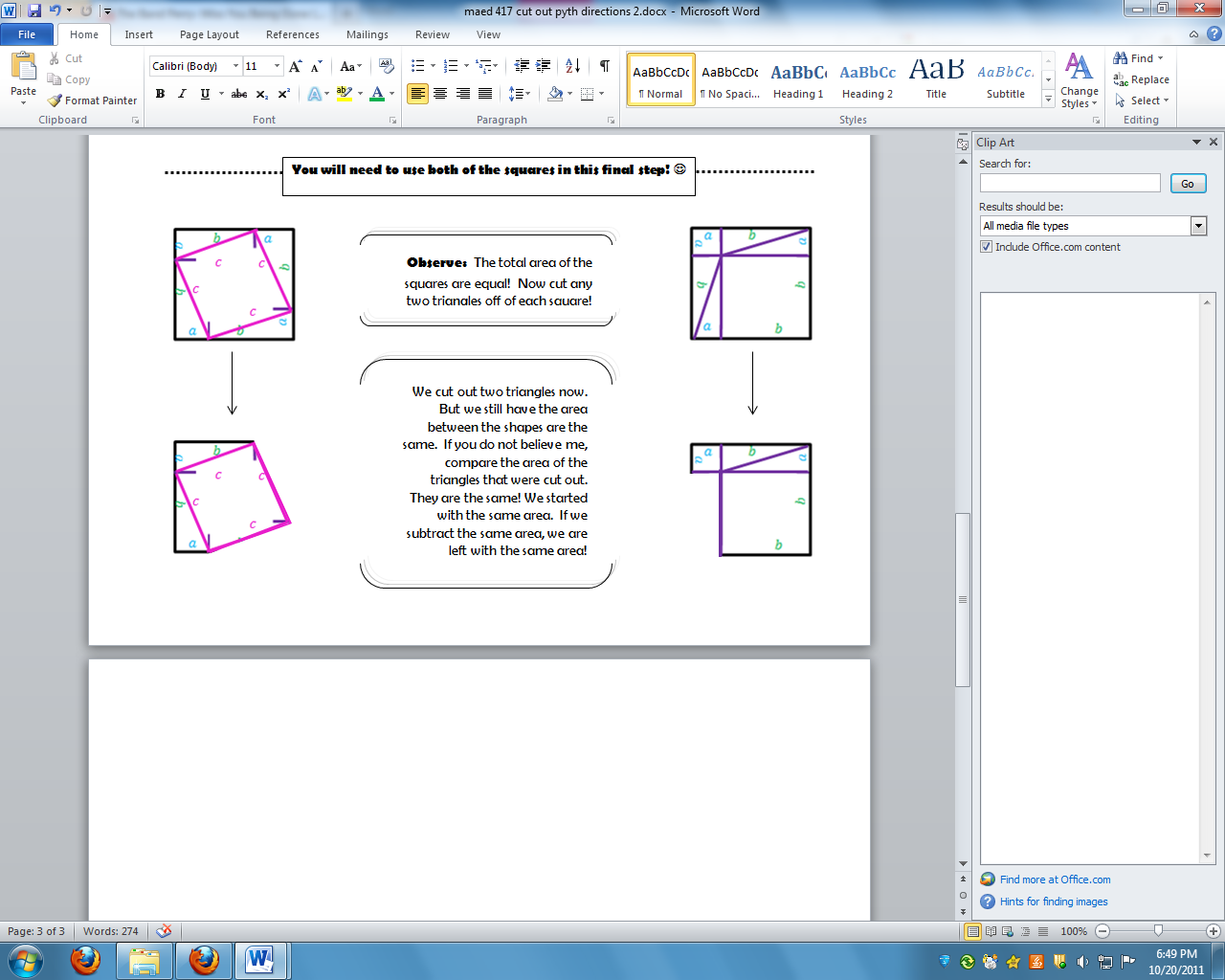
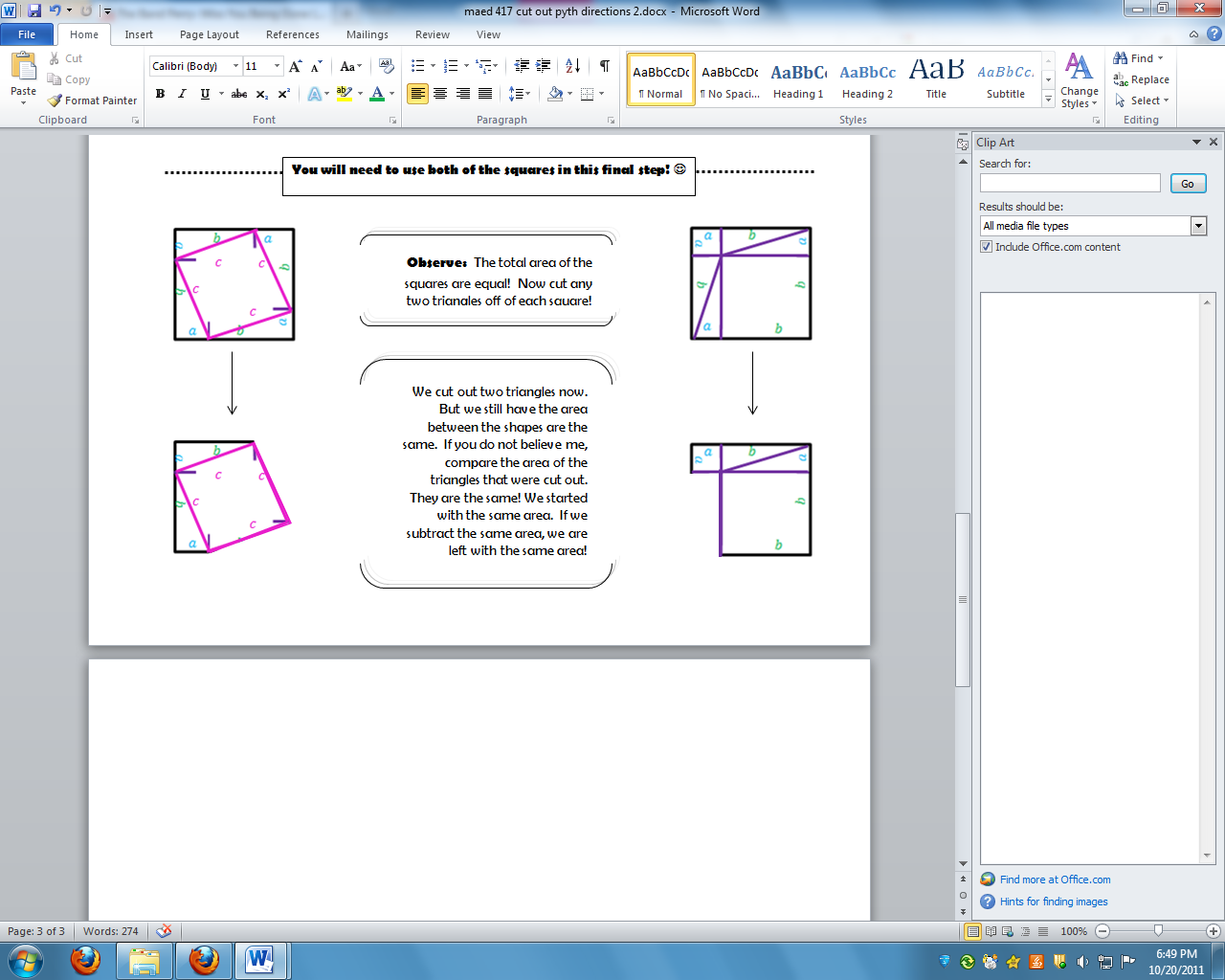
Cut two more triangles from each shape.





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The areas of the two shapes are still the same. Once again the triangles that were cut out are the same area! We are left with the same area!

Find the area of each square!

We found that the areas by multiplying by the base and the height of each square.

It is the Pythagorean Theorem!

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**Fun Math Website**

* <http://www.historyforkids.org/learn/greeks/science/math/pythagoras.htm>