

# Dudley Weldon Woodard

## Worksheet



1881-1965

In a time when there was a “widespread American belief that blacks and females couldn’t learn mathematics as easily as white males (Journal, p.270),” Dudley Weldon Woodard was at the height of his career as a mathematician. Woodard surpassed the racial barriers of the early part of the twentieth century to become only the second African American to receive a Ph.D. in mathematics.

Woodard published three papers in his career, one of which focused on the Jordan curve-theorem. This theorem deals with simple, closed curves and the regions their boundaries form. A simple closed curve is a curve that starts and ends at the same point (closed), and does not cross itself (simple). Woodard’s work on the Jordan curve-theorem was geared mainly at eliminating all assumptions that it was true, and establishing a concrete proof for this theorem.

- In your own words describe the following terms:

Simple:

Closed:

Fill in the Blank:

1. An example that illustrates why it is hard to tell if you are inside or outside of a curve is the \_\_\_\_\_, which is a well-known fractal.
2. This snowflake has \_\_\_\_\_ perimeter and \_\_\_\_\_ area.  
Explain in your own words why this is so:
3. The Jordan curve-theorem divides the plane into one \_\_\_\_\_ component and one \_\_\_\_\_ component.

4. Woodard was the \_\_\_\_\_ African American to receive his Ph. D. in mathematics.
  
5. The proof of the Jordan curve-theorem seems trivial. However, Woodard showed that the proof of the Jordan curve-theorem was nontrivial. After all, his proof for the theorem was 24 pages long! Explain in your own words why the proof to this theorem is not obvious. You may refer to the Koch Snowflake in your explanation.

#### References

<http://www.math.upenn.edu/History/bh/text99.html>

[http://www.math.buffalo.edu/mad/PEEPS/Woodard\\_dudleyw.html](http://www.math.buffalo.edu/mad/PEEPS/Woodard_dudleyw.html)

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