MATH 2551 Multivariable Calculus: Stokes' theorem

1. What is the name of the theorem that states that the surface integral of the curl of a vector field over a closed surface is equal to the line integral of the vector field around the boundary of the surface?

A. The Divergence Theorem
B. The Fundamental Theorem of Calculus
C. The Chain Rule
D. Stokes' Theorem

2. What is the surface integral of the curl of a vector field over a closed surface?

A. The line integral of the vector field around the boundary of the surface
B. The surface integral of the divergence of the vector field over the surface
C. The surface integral of the vector field over the surface
D. None of the above

3. What is the line integral of the vector field around the boundary of the surface?

A. The surface integral of the curl of the vector field over the surface
B. The surface integral of the divergence of the vector field over the surface
C. The surface integral of the vector field over the surface
D. None of the above

4. Which of the following is true?

A. The surface integral of the curl of a vector field over a closed surface is equal to the line integral of the vector field around the boundary of the surface if and only if the surface is orientable.
B. The surface integral of the curl of a vector field over a closed surface is equal to the line integral of the vector field around the boundary of the surface if and only if the surface is not orientable.
C. The surface integral of the curl of a vector field over a closed surface is equal to the line integral of the vector field around the boundary of the surface.
D. None of the above

5. Which of the following is not a necessary condition for Stokes' Theorem to hold?

A. The surface must be orientable.
B. The surface must be closed.
C. The vector field must be continuous.
D. The vector field must have a curl.

Answer Key:

1. D
2. A
3. A
4. C
5. D