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1. Introduction

~~In physics and mathematics, Green'~~Green's theorem ~~gives~~ indicates the relationship~~ship~~ between a line integral around a simple closed curve C and a double integral over the ~~plane~~plane region D bounded by C. This theorem is an application of the fundamental ~~Theorem~~theorem of calculus for ~~to~~ integrating a certain combination~~s~~ of derivatives over a plane. ~~It~~ This theorem can be ~~proven~~ easily proven for rectangular and triangular regions. As ~~Both~~both sides of ~~it's~~its equality are finitely additive and almost all planar regions can be divided into triangles and rectangles, ~~so that~~ the result holds for any planar~~-~~ region ~~practically all of, which can be divided in to triangles and rectangles~~. ~~This proves the theorem for reasonably shaped regions.~~ ~~It's~~ Its generalization to ~~the~~ non-planar surfaces (~~— proved~~ directly proved ~~from it by~~ using the finite additivity of both sides~~-~~) is the Stokes' ~~Theorem~~ theorem described below.

1.1 ~~Greens~~Green's Theorem

~~Its~~ The formal statement of Green's theorem is as follows~~—:~~: Let S be a sufficiently nice region in the plane, and let δ S be its boundary~~;then~~. Then, we have~~;~~

$$\iint_S \left(\frac{\partial v_2}{\partial x}-\frac{\partial v_1}{\partial y}\right)dx\,dy=\oint_{\delta S}(v_1dx+v_2dy)$$

where the boundary~~,~~ δ S is traversed counterclock~~-~~wise on ~~it's~~its outside cycle~~,~~ (and clockwise on any internal cycles as ~~you~~ can be ~~verify~~ verified using zippers~~.)~~).

~~Meaning of this t~~Theorem interpretation: ~~Green's~~Green's theorem is a form that the fundamental theorem of calculus ~~take~~takes in the context of integrals over planar regions.

For a rectangle: ~~By~~ Using the ordinary fundamental theorem of calculus, we have~~;~~

Comment [A1]: Providing concise and clear sentences often aids clarity and enhances readability.

Comment [A2]: Repetitive mention of an information in subsequent sentences may lead to redundancy and repetition.

Comment [A3]: Sentences should begin with the noun, following by its pronoun in subsequent sentences.

Comment [A4]: In academic writing, information is presented with accuracy and conciseness. Formal language is a hallmark of academic English. One way to ensure conciseness in expression is converting phrasal verbs to formal words.

$$\int_{x=a}^{x=b}\int_{y=c}^{y=d}\frac{\partial v_2(x,y)}{\partial x}-\frac{\partial v_1(x,y)}{\partial y}\,dy\,dx=\int_{y=c}^{y=d}(v_2(b,y)-v_2(a,y))dy-\int_{x=a}^{x=b}(v_1(x,d)-v_1(x,c))dx$$
.

For a right triangle: ~~f~~For convenience, we choose a triangle bounded by line x = 0, y = 0, and $\frac{x}{a}+\frac{y}{b}=1$.

We similarly ~~get~~obtain~~:~~

$$\int_{y=0}^{y=b}\int_{x=0}^{x=a-ya/b}\frac{\partial v_2(x,y)}{\partial x}\,dx\,dy-\int_{x=0}^{x=a}\int_{y=0}^{y=b-xb/a}\frac{\partial v_1(x,y)}{\partial y}\,dy\,dx$$
$$=\int_{y=0}^{y=b}(v_2(a-ay/b,y)-v_2(0,y))dy-\int_{x=0}^{x=a}(v_1(x,b-bx/a)-v_1(x,0)dx$$
.

~~Rearrangement of right hand side gives the~~ Theorem for rectangles and right triangles is obtained by rearranging the right hand side of the equation.

~~It means that~~Thus,~~,~~ for R, a rectangle or right triangle in the x-y plane~~,~~ (for which d**S** = dS**k**), we have

$$\iint_R \bar{\nabla}\times\bar{v}\bullet d\bar{S}=\oint_{\delta R}\bar{v}\bullet d\bar{l}$$
.

Both sides of this equation ~~is finite~~are finitely additive~~:~~, ~~that is~~i.e., if we evaluate either side over~~we take~~ two disjoint regions~~, and evaluate either one over both~~, ~~you get~~ the result will be equal to the sum of ~~their values~~the result of separate evaluations on the two regions ~~separate~~. This is true even if the regions share a common boundary~~,~~ because the line integrals will cancel out over the common boundary ~~which~~ that ceases to be a boundary.

The result follows from additivity for any region that can be ~~broken up~~divided into rectangles and triangles, which accounts for most regions we will encounter.

Comment [A5]: Dependent clauses are not separated by a comma.

Comment [A6]: If the first letter of a word has a vowel sound, "an" should be used, If the first letter has a consonant sound, "a" should be used.