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vector fields, the  
divergence and  
curl, are

introduced in  
terms of fluid  
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integral  
theorems of  
Gauss (the  
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theorem),  
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Green are introduced also in the context of fluid mechanics. The final application of vector analysis consists of the introduction of non-Cartesian coordinate systems with



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straight axes,  
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hyperbolic,  
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directions, and  
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these directions  
simplifies the  
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The parabolic  
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equations have  
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characteristics;  
this gives useful  
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character of the equation, but does not help in solving problems. The elliptic partial differential equations do not have real characteristics. In contrast to most texts,

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rather than  
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abandoning the  
idea of using  
characteristics,  
here the complex  
characteristics  
are determined,  
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these

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characteristics.  
This leads to a  
generalized  
complex variable  
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written in terms  
of a complex  
velocity, and the  
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the curl of the  
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vector field is  
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