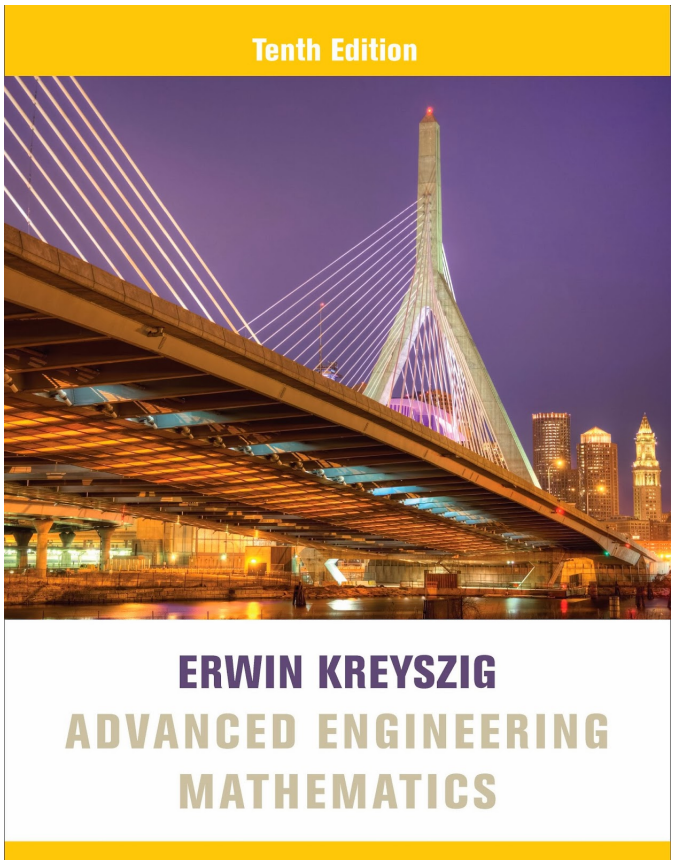
Calculus By Howard Anton 8th Edition Free Download



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Introduction In order to solve differential equations, one must know the behavior of the solutions and the solution methods must be chosen so that they ensure that the solutions remain within certain regions of the solution space. Differential equations are a rather general type of problem and a solution method must be chosen for each. For example, when one has a system of first-order differential equations, then one might choose to solve using the method of integrating factor. For second-order differential equations, the method of variation of parameters is usually appropriate, while for more general systems of equations, one can use a number of different methods. With this chapter, we first give an overview of the solution methods for differential equations. The methods are presented in the order in which they were developed and so provide a convenient way of illustrating how the methods have been extended and applied to problems involving more than one variable, to problems with singularities, to problems with complex coefficients, and so on. By showing how the solution methods are used, this chapter will also provide an insight into how problems of more complex nature may be tackled. In the second part of the chapter, we look at how differential equations have been extended to systems of differential equations, to multivalued functions, and how they have been generalized. We will then give a short introduction to the various solution methods for systems of differential equations that have been developed. This will show how a single differential equation can be extended to a system of differential equations and so provide a convenient way of illustrating how the methods have been extended and applied. A Very Short History of the Calculus This is the kind of problem that calculus was born to solve. When Leibniz posed the differential equation (2), (3) looked like it should have been a relatively straightforward exercise in calculus. The major difficulty was that the unknown function f(x) was allowed to be a complex function. Yet the integral was written in terms of the real parts of the integrand and the integral itself. The complex nature of the solution would not emerge for more than a century. As can be seen from the solution, this integral is just a special case of (18) and so generalizes to the complex case. That is, the integral in (17) is just a special case of (21). For example, (17) is written in terms of the real part, f(x) = Re . Let . Then the integral is just a special case of (19) and the argument of the gamma function is taken as -4 since 82157476af