

Preface

This 3rd volume of the *Formulas and Problems* concludes the series to the basic courses in Engineering Mechanics.

Experience shows that the field of Dynamics is particularly difficult for students, because besides the concept of force now additional kinematic quantities occur, which must be brought into relation with each other and with the forces. Therefore, with numerous purely kinematical problems, we tried to deepen the understanding of the relevant geometric quantities and their description in different coordinate systems. Likewise, only by exercises, i.e. by an independent treatment of problems, one can gain experience, which basic principle leads to the solution in the simplest way. Often there are several approaches possible. Therefore we demonstrate this frequently so that the reader can realize the advantages and disadvantages of the alternatives.

As in the 1st and 2nd volume, we deliberately placed the emphasis on the principal way how to apply the theory and not in numerical results. The correct formulation of the relevant basic equations and their solution is in the beginning much more important than numerical calculations without a deeper understanding of the background.

Experience also shows that it is an illusion to believe that simply reading and trying to comprehend the presented solutions leads to an understanding of the theory. Neither does it improve the problem solving skills. Therefore, we strongly recommend that the reader first tries to solve the problems independently, possibly by using other approaches. Let us emphasize that a collection of formulas and examples is only an additional aid when studying mechanics and it cannot replace a textbook. When the reader is not familiar with one or the other formula or concept, it is necessary to brush up the theory with the help of a textbook; a number of titles can be found in the list of references.

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