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Introduction

A NOTE TO STUDENTS

A good number of problems have been provided in this book. Some are easy, some are of average difficult level, some difficult and some problems will challenge even the best amongst you. It is advised that you first master the concepts covered in your textbook, solve the examples and exercises provided in your textbook and then attempt to solve the problems given in this book. There is no single prescription which can help you in solving each and every problem in physics but still researches in physics education show that most of the problems can be attempted if you follow certain steps in a sequence. The following prescription due to Dan Styer presents one such set of steps :

1. Strategy design
 - (a) Classify the problem by its method of solution.
 - (b) Summarise the situation with a diagram.
 - (c) Keep the goal in sight (perhaps by writing it down).
2. Execution tactics
 - (a) Work with symbols.
 - (b) Keep packets of related variables together.
 - (c) Be neat and organised.
 - (d) Keep it simple.
3. Answer checking
 - (a) Dimensionally consistent?
 - (b) Numerically reasonable (including sign)?
 - (c) Algebraically possible? (Example: no imaginary or infinite answers)
 - (d) Functionally reasonable? (Example: greater range with greater initial speed)
 - (e) Check special cases and symmetry.
 - (f) Report numbers with units specified and with reasonable significant figures.

We would like to emphasise that the problems in this book should be used to improve the quality of teaching-learning process of physics. Some can be directly adopted for evaluation purpose but most of them should be suitably adapted according to the time/marks assigned. Most of the problems included under SA and LA can be used to generate more problems of VSA or SA categories, respectively.

