

Homework 1 --- Paraphrase Exercise

要求:

- ✓ 2024年11月26日上午8点前将 Word 电子版发至 yexu@cau.edu.cn，邮件请注明名字。
- ✓ 如果有句子是原封不动被抄下来，作业分数为零。
- ✓ 如果有互相抄袭现象，平时成绩 40 分全部扣除。

1. Its allure crosses disciplinary boundaries, in part because it is described by a nonlinear field theory and also because it is readily observed.
2. The idea of treating fluids as continuous media is both natural and familiar. It is, however, worthwhile to review the continuum hypothesis - that reconciles the discrete molecular nature of fluids with the continuum view - so as to avoid confusion when quantities such as 'fluid particles' and 'infinitesimal material elements' are introduced.
3. Turbulence is also effective at 'mixing' the momentum of the fluid. As a consequence, on aircraft's wing and ships' hulls the wall shear stress (and hence the drag) is much larger than it would be if the flow were laminar. Similarly, compared with laminar flow, rates of heat and mass transfer at solid-fluid and liquid-gas interfaces are much enhanced in turbulent flows.
4. The major motivation for the study of turbulent flows is the combination of the three preceding observations: the vast majority of flows is turbulent; the transport and mixing of matter, momentum, and heat in flows is of great practical importance; and turbulence greatly enhances the rates of these processes.
5. A fluid is composed of a large number of molecules in constant motion undergoing collisions with each other, and is therefore discontinuous or discrete at the most microscopic scales.