

Contents

1	Problem Types	3
2	Derivations	5
3	Concepts	7
4	Equations	9
4.1	Euler-Lagrange Eq.'s	9
4.2	Invariance of the Lagrangian	9
4.3	Parallel Axis Theorem	9
4.4	Intermediate Axis Theorem	9
4.5	Hamilton's Eq.'s	9

Chapter 1

Problem Types

Chapter 2

Derivations

Chapter 3

Concepts

Chapter 4

Equations

4.1 Euler-Lagrange Eq.'s

Euler-Lagrange Equations

For one coordinate q

$$\frac{d}{dt} \frac{\partial \mathcal{L}}{\partial \dot{q}} - \frac{\partial \mathcal{L}}{\partial q} = 0$$

4.2 Invariance of the Lagrangian

For the two Lagrangians

$$\mathcal{L} = T - V$$

and

$$\mathcal{L}' = T - V + \frac{df(x, t)}{dt}$$

the dynamics are exactly the same for *any* function $f(x, t)$.

4.3 Parallel Axis Theorem

4.4 Intermediate Axis Theorem

4.5 Hamilton's Eq.'s