

Classical Mechanics, Autumn 2017

Assignment #6, Due 15/12/2017

(All questions numbers refer to Goldstein, Edition 2)

To be submitted:

1. Canonical Transformations: Exercise 9 [$Q_1 = q^2, Q_2 = q_1 + q_2$]
2. Canonical Transformations: Exercise 14 [charge in a magnetic field]
3. Canonical Transformations: Exercise 17 [$Q = p + iaq$, harmonic osc.]
4. Canonical Transformations: Exercise 33 [$V = mk/x^2$]
5. Hamilton-Jacobi: Exercise 6 [Harmonic potential, magnetic field]
6. Hamilton-Jacobi: Exercise 8 [$H = p^2/(2m) - mAtx$]
7. Hamilton-Jacobi: Exercise 12 [Square well, action-angle variables]
8. Hamilton-Jacobi: Exercise 16 [Particle in vertical plane, action-angle]

Not to be submitted:

1. Canonical Transformations: Exercise 2 [$H = p^2/2 - 1/(2q^2)$]
2. Canonical Transformations: Exercise 15 [$Q = \alpha p/x$, harmonic osc.]
3. Canonical Transformations: Exercise 19 [System of n particles]
4. Canonical Transformations: Exercise 23 [PB, charged particle in $\vec{B}$]
5. Canonical Transformations: Exercise 24 [PB, Kepler orbit]
6. Canonical Transformations: Exercise 30 [Finding constants of motion]
7. Hamilton-Jacobi theory: Exercise 5 [S for harmonic oscillator]
8. Hamilton-Jacobi theory: Exercise 13 [$V = F|x|$, action-angle variables]

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