

# Midterm Exam No. 02 (2020 Spring)

## PHYS 510: CLASSICAL MECHANICS

*Department of Physics, Southern Illinois University–Carbondale*

Date: 2020 Apr 14

1. **(20 points.)** (Under construction)
2. **(20 points.)** (Under construction) Perfectly rolling gears.
3. **(20 points.)** (Under construction) At what time of year is  $r = r_0$  in the Kepler problem?
4. **(20 points.)** Refer to the essay by J. M. Luttinger titled ‘On “negative” mass in the theory of gravitation’ in 1951.
  - (a) Reproduce all the equations in the essay.
  - (b) Critically assess the logic of the arguments in the essay.