ADVANCED PHYSICS CLUB

MARCH 28, 2021

Useful resources

The updates, homework assignments, and useful links for APC can be found on SchoolNova's web page:
`https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2020`
The practical information about the club and contacts can be found on the same web page.

Today's meeting

This homework is mostly devoted to preparing for the PhysicsBowl exam (part I). There is also a short part II with one of the problems from our previous homework (assigned on March 21) and one new problem. All PhysicsBowl exams could be found on the following webpage:
`https://www.aapt.org/Programs/PhysicsBowl/printexams.cfm`
If you have any questions about PhysicsBowl problems, please ask them on our Discord!

Homework part I

1. Solve 2016 PhysicsBowl exam completely. Try to pay attention what time does it take you to finish the exam.

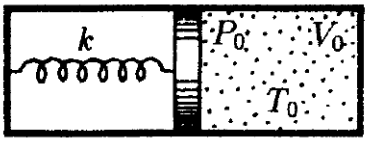
2. Solve the following problems on thermodynamics from 2007 PhysicsBowl exam: 38, 39, 40, 45, 46.

3. Solve the following problems on thermodynamics from 2008 PhysicsBowl exam: 4, 22, 39, 44.

Homework part II

4. A gas is expanding in such a way that $pV^2 = const$. Does it become hotter or cooler?

***5.** (Originally assigned on March 21) A system consists of monatomic gas with parameters p_0, V_0, T_0 in a container and a piston which is held by a spring. There is vacuum to the left of the piston. If it were not for the gas, the piston would touch the right wall of the container and the spring would not be deformed then. Find heat capacity of this system.



For the next meeting

IMPORTANT: The next club's meeting is at 3:00pm, via Zoom, on Sunday, **April 11**.