Non-exhaustive Topical Guide to worksheet coverage: physics 240FA13

1: dimensional and unit analysis: SI units: basic trigonometry : basic vectors: dot product: displacement vector
2: 1-d motion with constant acceleration:1-d equations of motion: average velocity
quadratic solution to 1-d equation of motion. time-dependent acceleration.
3:freefall:vector g: introduction 2-d freefall
4:2-d motion: velocity vector: relative motion:2-d relative motion
5:monkey shoot: orbital velocity: more relative motion: standard 2-d problem
6:newton's law (1,2,3):obtain a from F: obtain f from a FBD (free body diagram)1
7:FBD 2:friction:tension:atwood's machine
8:FBD 3:inclined plane
9:Work:Conservative vs. Non-conservative: Hooke's law:
Energy conservation for conservative forces: Newton's law: work energy theorem
10: applications of work energy theorem with conservative, non-conservative and rotated systems.
11:additional applications of work energy theorem with conservative, non-conservative and rotated systems.
12: uniform circular motion with applications
13:Forcing one's mind into an inertial reference frame: the hard problems.
14:momentum and conservation of momentum: applications in problems with friction
15:additional applications of momentum conservation
16: non-uniform circular motion
17: torque and moment of inertia: Angular momentum 1:Rotational KE (kinetic energy)
18:static equilibrium: problems involving statics
19:Archimedes' principle, density
20: rotational quantities: additional applications: conservation of angular momentum
21: vibrations and SHO (simple harmonic oscillation):restoring forces
22: SHO: simple pendulum
23: waves I
24: modes of vibration on a string, energy and power
25: open and closed organ pipes: standing longitudinal waves of sound
26: beat frequencies and the Doppler shift
27: specific heat and linear expansion
28: isovolumeric, isobar, isotherm, latent heat
29: adiabatic, Carnot cycle
30: entropy
31:applications of Bernoulli's equation