

Non-exhaustive Topical Guide to worksheet coverage: physics 240FA12

- 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