

Non-exhaustive Topical Guide to worksheet coverage: physics 240FA11

- 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)
- 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: isovolumetric, isobar, isotherm, latent heat
- 29: adiabatic, Carnot cycle
- 30: entropy
- 31: applications of Bernoulli's equation