

# Review topics for 161 Final

## Chapter 2

free fall motion

Example 2.8 (parts a and b)

## Chapter 3

projectile motion

no problems on relative velocity

Example 3.8

## Chapter 4

Newton's Second Law

free-body diagrams

vector forces

action-reaction

force of friction

block on inclined plane

no problems on Newtonian gravity

Examples 4.9, 4.14

## Chapter 5

work

kinetic energy

work-energy theorem

potential energy

gravitational potential energy (surface of the earth)

spring force

spring potential energy

conservation of energy

work lost to friction

Examples 5.1, 5.5, 5.9

## Chapter 6

momentum

conservation of momentum

impulse

perfectly inelastic collisions

elastic collision in CM (1 dimensional)

elastic collision with stationary infinite mass (1 dimension)

no problems on glancing collisions

no problems on rocket propulsion

Example 6.4

## Chapter 7

centripetal acceleration

centripetal force

loop-the-loop

Newtonian gravity  
gravitational potential energy  
escape velocity  
Example 7.8

## Chapter 9

pressure  
buoyant force  
equation of continuity  
Bernoulli's equation  
no problems on Poiseuille's Law  
Examples 9.8, 9.11, 9.13, 9.14

## Chapter 10

meaning of temperature  
thermal expansion  
ideal gas law  
root mean square velocity  
Examples 10.6, 10.10

## Chapter 11

specific heat  
calorimetry  
latent heat  
black body radiation  
Examples 11.3, 11.5, 11.10

## Chapter 12

First Law of Thermodynamics  
work done on a gas and work done by a gas  
isoobaric process  
isovolumetric process  
isothermal process  
adiabatic process  
heat engine (definition and efficiency)  
Second Law of Thermodynamics  
properties of a reversible engine  
Carnot cycle  
entropy  
Examples 12.4, 12.6, 12.7, 12.9, 12.11

## Chapter 13 (13.1 - 13.4, 13.7 - 13.9)

Hooke's Law  
elastic potential energy  
position, velocity and acceleration of mass on spring as function of time  
amplitude, period, wavelength and frequency  
relation between wavelength, frequency and speed for a wave  
Example 13.4, 13.6,

## Chapter 14 (14.8 - 14.10)

standing waves

Examples 14.8, 14.9

## Chapter 15 (15.1 - 15.6, 15.8)

Coulomb's Law

electric field of a point charge

superposition of electric fields

electric field lines

properties of a conductor

Example 15.5

## Chapter 16 (16.1 - 16.3, 16.6 - 16.7, 16.9)

electric potential of a point charge

superposition of electric potential

electric potential energy

parallel plate capacitor

energy stored in a capacitor

Examples 16.4, 16.5, 16.6

## Chapter 17 (17.1 - 17.4, 17.6)

electric current

drift velocity

resistance and resistivity

Ohm's Law

power dissipated in a resistor

Examples 17.3

## Chapter 22 (22.1 - 22.5, 22.7)

Law of reflection

Law of refraction (Snell's Law)

index of refraction

dispersion

total internal reflection

Examples 22.2, 22.6

## Chapter 23 (23.1 - 23.7)

concave mirrors

convex mirrors

thin lenses

combination of lenses

aberrations

Examples 23.2, 23.3, 23.7, 23.9

## Chapter 29 (29.3 - 29.5)

decay constant and half-life

alpha, beta and gamma decay

Examples 29.2