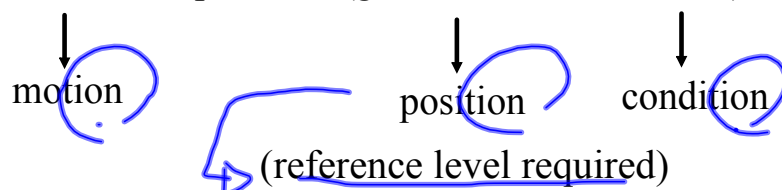


Thursday, May 30/13
Physics 112/111

1. Return -> ICA: Power, Efficiency and Energy Conservation
 2. Check: Worksheet - Wave Equation and More -> P4
 3. Refraction Cases: #1, 2, 3
 4. Wave Behaviours - Refraction (Continue)
-

Exam: Outline - Chapter 6 and Chapter 7

- work (scalar quantity) W joules.
- three cases when work is not done mc (2)
- positive and negative work mc .
- energy (scalar quantity) E 1 joules.
- types of energy: kinetic and potential (gravitational and elastic)



- work-kinetic energy theorem $W = \Delta E_k$
- work-gravitational potential energy theorem $W = \Delta E_g$ *

- Hooke's Law - applied force and restoring force
 - compression and extension
 - spring constant \rightarrow slope
 - elastic limit
-

- power (scalar quantity) $P = \frac{W}{t} = \frac{F \cdot d}{t} = F \cdot v$

- efficiency
 - conservation of energy: $E_{ki} + E_{gi} + E_{ei} = E_{kf} + E_{gf} + E_{ef}$ *
- $$E_{Ti} = E_{Tf}$$

~ 3 problems. $\left[\begin{matrix} 2 \\ 4 \\ 3 \end{matrix} \right] 9$

Exam: Outline - Chapter 4 and Chapter 5

- force (vector quantity)
- five examples: gravitational force (weight), applied, normal, force of friction (static and kinetic), tension
- coefficient of friction (static and kinetic) μ - no unit
 $\mu < 1$
- contact/non-contact forces
- FBDs (free body diagram)
- state of equilibrium ($F_{\text{net}} = 0 \text{ N}$, $\mathbf{v} = 0 \text{ m/s}$ or \mathbf{v} is uniform)
- Newton's Three Laws of Motion
 - 1st: $F_{\text{net}} = 0 \text{ N}$ (Chapter 4) ($L \sim Q \text{ static}$)
 - 2nd: $F_{\text{net}} = m\mathbf{a}$ (Chapter 5)
- * May need kinematic equations in C5.
Review
12/5/17
- 3rd: For every action there is an equal but opposite reaction.
- Atwood's Machine and Fletcher's Trolley $\leftarrow L1$
- momentum (vector quantity) \vec{p}
- impulse (vector quantity) \vec{J}
- impulse/momentum theorem $\vec{J} = \Delta\vec{p}$

~ 4 problems

C4
C5 $\rightarrow \text{O}$
 $\rightarrow \text{O}$
 $\vec{J} = \Delta\vec{p}$

Exam: Outline - Chapter 2 and Chapter 3

1. physics *mc*.
2. kinematics/dynamics *mc*
3. frames of reference: fixed/moving *mc*
4. scalar quantity - magnitude only *mc*
5. conventional directions *prob.*
6. vector quantity - magnitude and direction *mc*
7. examples of scalar and vector quantities *mc*
8. ~~graphical addition of vectors: tip-to-tail/parallelogram method~~ *mc*
9. ~~analytical addition of vectors~~
10. Level 1 - subtracting vectors } *mc*
- perpendicular components
11. vocabulary: distance, position, displacement, time, *mc*
speed, velocity, acceleration, etc.
12. symbols and units of physical quantities *mc*
13. types of motion: uniform/uniformly accelerated *mc*
14. ~~position-time graphs~~
15. velocity-time graphs *mc* *slope \rightarrow acc.*
area \rightarrow displ.
16. relationship between directions of velocity and acceleration
 $\uparrow \left. \begin{array}{l} \vec{v} +ve \\ \vec{a} -ve \end{array} \right\} \begin{array}{l} \text{slows} \\ \text{down.} \end{array}$ $\downarrow \left. \begin{array}{l} \vec{v} -ve \\ \vec{a} -ve \end{array} \right\} \begin{array}{l} \text{speeds} \\ \text{up.} \end{array}$
17. checklist for word problems *prob.*
18. motion equations ~~including derivations~~ *prob.*
19. acceleration due to gravity *prob.*
20. freely falling bodies *prob.*

Problems: kinematic equations
& freely falling body.

no prob