

1) Magnitude & Direction

2) Break into components

3) Velocity is a vector, & can be negative

4) Velocity

5) Rate of change of velocity

6) Displacement

7) Acceleration

8) Initial Velocity

9) Change in Velocity

10) 0

11) y (Vertical)

12) $y - y_0 = v_{oy}t + \frac{1}{2}at^2$ ($v_{oy} = 0$)

13) $y - y_0 = v_{oy}t + \frac{1}{2}at^2$ ($v_{oy} = 0$)

14) $v = v_0 + at$ ($a = 10 \frac{m}{s^2}$)

15) $v_x = v_{ox}$ or $v = v_0 \cos \theta$

16) $v_y = v_{oy} + at_y$

17) $A \neq E$ and $B = D$

18) Same for all

19) Down

20) 0

21) No net force in x direction


22) No net force in y direction
(Vertical Equilibrium)

23) 0 = equilibrium (No net force)
nonzero = When its accelerating

24) It's Not

25) When an object touches a surface, Normal (perpendicular) to the surface

26) $F_{gx} = mg \sin \theta$

27) Meh, don't like the Q . 

28) $\frac{2\pi r}{T} = v$

29) $a_c = \frac{v^2}{r}$; $F_c = ma_c$

30) Right(A), UP(B), left(C)

31) Down(A), Right(B), Up(C)

32) It isn't

33) Net force towards center of circular motion, $F_c = \frac{mv^2}{r}$

34) Tension, gravity, Normal Force

35) O , F_c is \perp to motion

36) ① $F_{g1} = \frac{GM_1M_2}{r^2}$

② $F_{g2} = \frac{G(2M_1)(3M_2)}{(2r)^2} = \frac{6GM_1M_2}{4r^2} = 1.5(F_{g1})$

37) $mg = \frac{GMm}{r^2} \rightarrow g = \frac{GM_p}{r^2}$

38) $m_1v_1 + m_2v_2 + m_3v_3 + \dots$

39) Elastic: KE is conserved
 $\rightarrow KE_1 = KE_2$
 Both $\Sigma p_1 = \Sigma p_2$

40) $\vec{J} = F \cdot t = \Delta \vec{p}$

41) Some of force is in direction of motion

42) Force vs. Distance

43) Work = change in KE

44) When an object trades height for speed, Energy (Total) is conserved.
 $KE_1 + PE_1 = KE_2 + PE_2$
 $\frac{1}{2}mv_1^2 + mgh_1 = \frac{1}{2}mv_2^2 + mgh_2$ (ONE OBJECT)

45) $mg(h_2 - h_1)$

46) SKIP (electricity)

47) Energy of motion ($KE = \frac{1}{2}mv^2$)

48) SKIP (Thermodynamics)

49) Power = $\frac{\text{Work}}{\text{time}}$

50) displacement = 0	velocity = maximum
U = 0 (Potential E)	KE = maximum

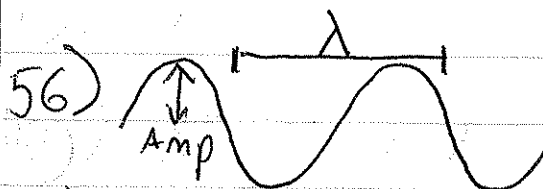
51) displacement = max	velocity = 0
U = max	KE = 0

52) Pendulums: length; gravity
 Springs: mass; k

53) Similar: Interference, amplitude, wavelength, period, speed, frequency
 Different: The way the particles move relative to wave velocity

54) $v = \lambda f$

55) $f \propto E$



57) SKIP

58) When a charge vibrates it emits a wave
The wave is made of fields, not matter

59) Radio - Micro - IR - Visible - UV - XRay - Gamma
ROYGBIV

60) ~~Reflection~~ ^{Refraction} - Bending of light when it changes mediums
Reflection - Light bouncing off something
Diffraction - Light bending around a barrier or opening

61) Angle of Incidence = Angle of Reflection

62) $n_1 \sin \theta_1 = n_2 \sin \theta_2$ (for refraction)

63) Light Reflects along the surface, instead of refracting into it.

64) Speed (and wavelength) decrease

65) frequency

66) lens: Convex

Mirror: Concave

67) lens: Concave

Mirror: Convex

68) Parallel \rightarrow focal Point

Center goes straight through

69) Parallel - focal point | Center of curvature reflects
Focal Pt. - Parallel | back on itself.

70) Back trace

71) $M > 0$ if the image is upright/Virtual

72) $f > 0$ for concave mirrors & Convex lenses

$d_o > 0$ (Almost Always)

$d_i > 0$ if image is in front of mirror or behind lens

h_o, h_i positive for up, negative for down

73) Real Images can be projected onto a screen.