1. D
   All objects fall at the same rate
2. B
   $W_F = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_f^2$
   $\mu mgD = \frac{1}{2}mv_0^2 - \frac{1}{2}mv_f^2$
   $\frac{1}{2}gD = \frac{1}{2}v_0^2 - \frac{1}{2}v_f^2$
   $v_f = 0\frac{m}{s}$
   $p = mv = 48kg \times \frac{m}{s}$
3. B.
   Point B is Point A + C
   Point A and C get swapped at 0.4 seconds
4. C
   $mgy_0 = mgy_f + 0.6J$
   $y_f = 1.2m$
5. A
   Gravitational potential energy does not decrease, which means B, C, and D are incorrect
6. B.
   Velocity is the slope of the line. Find the slope of the line at the specific point the retrieve velocity
7. C.
   It's around 4
8. D.
   Because period is around $\frac{1}{2}s$, using $f = \frac{1}{T}$, solve for f
9. D
   $F = \sqrt{10^2 + 10^2}$
   $F = 10\sqrt{2}$
10. A
    $sin\theta = \frac{y}{3.6m}$
    $y = 1.8m$
    $m_A gy = \frac{1}{2}m_A v^2$
    $gy = \frac{1}{2}v^2$
    $v = 6\frac{m}{s}$
    $p = m_A v$
    $m_A v_0 = (m_A + m_B)v_f$
    $v_f = 2.4\frac{m}{s}$
11. D
    This is because at the end of the day, the student still has to do mgywork on the box
12. B
    The original force would be $5F$, the new force is $4F$, thus meaning that the new force is $\frac{4}{5}$of the original force
13. C
    $L = \tau t$
14. B
    No idea (Most work)
15. B
16. A
17. C
    Momentum will increase
18. B
19. B
    Calculate voltage from left branch as voltage is the same between the two branches
20. D
21. D
22. C
    Momentum is mv
23. D
    $-\frac{m^2}{r} - 2(\frac{2m^2}{r})$
24. D
25. C
26. D
    It is equal to the tension
27. B
28. D
29. C
    $T = 2\pi\sqrt{\frac{m}{k}}$
30. D
    Use this to determine wavelength

31. C
    If F is applied R distance away, R must be $\frac{1}{2}$of the original if the force is going to be $2F$. The torque need to be equal for equilibrium
32. B.
    Horizontal is not going to be affected by this bounce because the ceiling is frictionless. Therefore it can only be A or B. The elastic bounce will cause velocity to instantly become negative, so it has to be B
33. D.
    $v = r\omega$
34. B.
    Elastic collisions maintain kinetic energy, inelastic ones lose kinetic energy
35. D.
    The force that pushes Astronaut X pulls on Astronaut Y. When Astronaut Y catches it, the astronauts stop moving.
36. A.
    Solve for k using $F = kx$, then substitute into $U = \frac{1}{2}kx^2$
37. A, C
38. C, D
    Answers cannot be A, as there is a mechanical force
39. A, D
40. A, C