

Physics Spring Final Review: Word Problems #2

FIRST SEMESTER FINAL REVIEW

Directions: Answer the following questions based on in-class notes, worksheets, and your Physics book.

Equations:

Velocity: $v = \frac{d}{t}$ rearrange and get $d = v \cdot t$ or $t = \frac{d}{v}$

Average velocity: $\bar{v} = \frac{\Delta d}{\Delta t} = \frac{(d_1 - d_0)}{(t_1 - t_0)}$ $\bar{a} = \frac{\Delta v}{\Delta t} = \frac{(v_1 - v_0)}{(t_1 - t_0)}$

Misc. motions equations: $v = v_0 + at$

Free Fall equations: $v = v_0 + gt$ $t = \sqrt{\frac{2d}{g}}$

Newton's second law: $F = m \cdot a$ rearrange and get $a = \frac{F}{m}$ or $m = \frac{F}{a}$

Gravity: $F \propto \frac{1}{d^2}$ Kinetic Energy $KE = \frac{1}{2}mv^2$

Gravitational Potential Energy: $U_g = m \cdot g \cdot h$

Conservation of Energy: $E = KE + U_g$

$$K_{before} + U_{g\ before} = K_{after} + U_{g\ after}$$

Work: $W = F \cdot d$ Power: $P = \frac{W}{t}$

Momentum: $p = m \cdot v$ $p_{before} = p_{after}$ $m_1v_1 = m_2v_2$

Ohms Law $I = \frac{V}{R}$ Power $P = IV$ Wave speed $v = \lambda f$

1. A car travels at a constant speed of 20.0 m/s for 12 seconds. How far did it go?

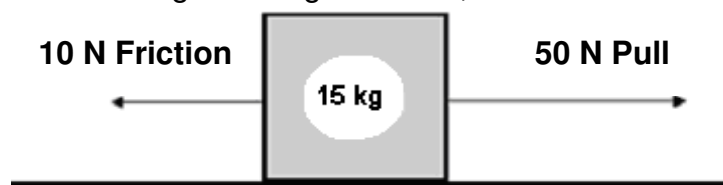
2. How much time will it take to walk 400 meters at a constant speed of 4.0 m/s?

3. You drop an object off the top of a 100 meter tall building. It falls freely and hits the ground 20 seconds later. What is the average speed of the object as it fell?

4. You drop a rock off the top of a tall cliff. How fast is it traveling 4.5 seconds later?

5. You drop a 3.0 kg rock from a height of 180 meters above the ground. How long will it take to hit the ground?

6. According to the figure below, what is the acceleration of the block?

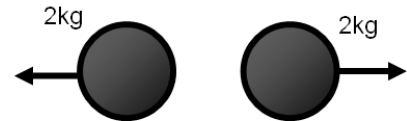


7. A net force of 160 Newtons is used to push a car about 50 yds. The car's acceleration is 2.0 m/s^2 . What is the mass of the car?

8. You kick a 1.6 kg stationary ball with a force of 7.5 Newtons. What is the force on your foot?

9. A sound wave traveling through a solid material has a frequency of 250 hertz. The wavelength of the sound wave is 3.0 meters. What is the speed of sound in the material?

10. Each of the 2 objects below moves with a velocity of 3m/s. What is the total kinetic energy of the system?



11. What is the kinetic energy of an object with a mass of 4.0 kg traveling at a speed of 3.0 meters/second? Assume no other forces act upon the object.

12. You lift a heavy rock with a mass of 25 kg to a height of 30 meters above the ground. What is the potential energy given to the rock?

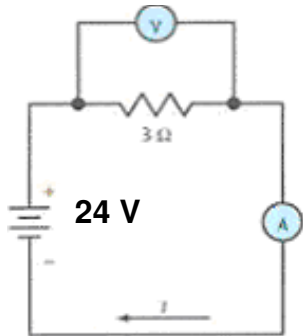
13. A 2.0 kg rock falls to the ground off the top of a 34 meter tall cliff. What is the Kinetic energy of the rock right before it hits the ground?

14. A 5.0 kg object is moving with a velocity of 15.0 m/s. What is its momentum?

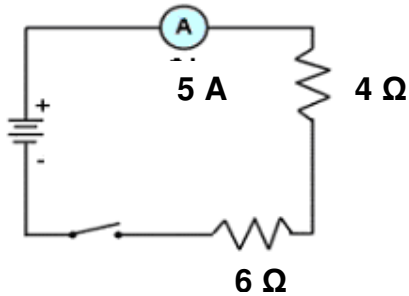
15. The diagram below represents an inelastic collision between two blocks on a frictionless air track. After the collision the two objects “stick” together. What is the mass of the second box?



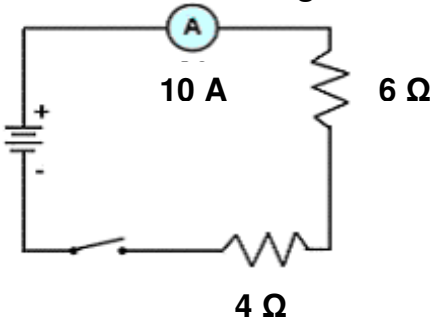
16. What would the **voltmeter** read in the circuit diagram below?



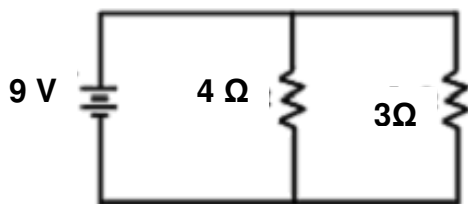
17. What is the total **resistance** in the circuit below?



18. What is the **voltage** in the circuit below?



19. What is the **current** going through the 3 ohm resistor?



20. The current flowing through the circuit below is **2.0 A**. What is the **potential difference**?

