

Physics

Name _____

Date _____ Period ____ # ____

Ingrum 10/96

Topic 11 Review Worksheet

1. If a rocket is launched with a velocity of 8.0×10^3 m/s, how high does it rise?

1. _____

2. A 1500 kg car traveling at 30.0 m/s has the same kinetic energy as a 4500 kg truck. What is the speed of the truck?

2. _____

3. A 2.0×10^3 kg car is pulled 345 m up a hill that makes an angle of 15° with the horizontal. What is the potential energy of the car at the top of the hill? If the car rolls down the hill, what will its speed be if we neglect friction?

3. _____

4. An arrow of mass 0.10 kg was fired horizontally from a height of 1.5 m by an archer who exerted a force of 350 N on the bowstring and pulled the string back 0.70 m. How far from the archer did the arrow land?

4. _____

5. A 75 kg person, starting from rest, slides down a slide 4.0 long inclined at an angle of 35° with the ground. The person reaches the bottom at a speed of 6.0 m/s. What percent of the potential energy was converted to heat?

5. _____

6. A 4.0 kg ball starts from rest and rolls down a hill 3.5 m high and up an adjoining hill 2.5 m high. What will its speed be when it reaches the top of the second hill?

6. _____

7. Two sticky oranges, each with a mass of 0.50 kg, are moving toward each other. One orange moves at 5.0 m/s and the other at 2.0 m/s. Assuming that the oranges stick together after the collision, compute the final velocity of the sticky mass.

7. _____

8. Calculate the kinetic energy before and after the collision in problem #7 and find out how much kinetic energy was “lost.”

8. _____

9. A heavy trunk is to be loaded onto a truck by pushing it up a plank inclined at 30.0° with the ground. A force of 5.0×10^2 N is necessary to keep the 1.0×10^3 N crate moving up the plane to a height of 1.5 m above the ground. How much work is done in pushing the crate up the plank?

9. _____

10. What is the increase in potential energy in problem #7?

10. _____

11. What is the efficiency of the system in problem #7?

11. _____

12. A 14700 N car is traveling at 25 m/s. The brakes are suddenly applied and the car slides to a stop. The average braking force between the tires and the road is 7100 N. How far will the car slide once the brakes are applied?

12. _____

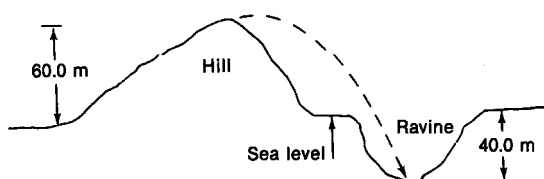
13. The regulation height for womens' high hurdles for high school competition is 84 cm. With what speed must a female hurdler leave the ground in order to clear the hurdle at a speed of 1.0 m/s?

13. _____

14. It is not uncommon on the service of a professional tennis player for the racquet to exert an average force of 150.0 N on the ball. If the ball has a mass of 0.060 kg, and is in contact with the strings of the racquet for 0.030 s, what is the kinetic energy of the ball as it leaves the racquet?

14. _____

15. A 4.0 kg rock is thrown from the top of a hill 60.0 m above the sea level using a catapult. The rock leaves the catapult with a speed of 20.0 m/s. As shown in the diagram below, the rock lands at the bottom of a ravine 40.0 m below sea level. Calculate the speed of the rock just before it hits the bottom of the ravine.



15. _____