

PHYSICS 11

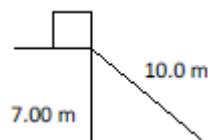
Potential (E_p) & Kinetic (E_k) Energy

Match the Variable with the unit		Matching	
F or $F_w =$ _____	8 N	1. Kinetic Energy	A. Uses energy and can create energy; calculated B. by multiplying force times distance. C. How far above the ground an object is. D. Energy of motion. E. Units for energy and work. F. Energy of position.
v = _____	8 m	2. Potential Energy	
h = _____	8 J	3. Work	
W or E = _____	8 m/s	4. Joules	
P = _____	8 w	5. h	
Potential (E_p) or Kinetic (E_k) Energy			
1. ___ A car is traveling 45 km/h. 2. ___ A rock is on a ledge 5 meters high. 3. ___ A car is resting at the top of a hill. 4. ___ A ball is thrown into the air and is still moving. 5. ___ A ball rolling on the ground.			
Circle the one with more Kinetic Energy		Circle the one with more Potential Energy	
1. A 25 kg mass or a 30 kg mass going 5 m/s. 2. Two 10 kg masses, one going 75 m/s, one going 45 m/s. 3. A car at rest or a car rolling down a hill. 4. A heavy bike or a light bike.		1. A 25 kg mass or a 30 kg mass at the top of a hill? 2. A car at the top of the hill or the bottom of a hill? 3. A plane on the ground or a plane in the air? 4. A full plane or an empty plane (both are flying)?	
Practice Problems			
1. Calculate the potential energy of a 5 kg object sitting on a 3 meter ledge.		4. A 4 kg bird has 8 joules of kinetic energy. How fast is it flying?	
2. A rock is at the top of a 20 meter tall hill. The rock has a mass of 10 kg. How much potential energy does it have?		5. A 8 kg cat is running 4 m/s. How much kinetic energy does it have?	
3. How high up is a 3 kg object that has 300 joules of energy?		6. A rolling ball has 18 joules of kinetic energy and is rolling 3 m/s. Find its mass.	

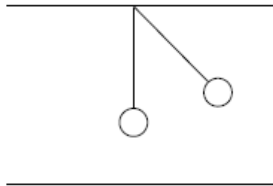
Homework

1. A 25.0 N object is held 2.10 m above the ground. What is the potential energy with respect to the ground?

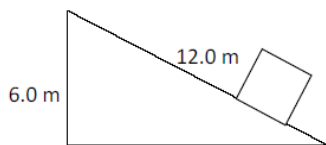
2. A 2.75 kg box is at the top of a frictionless incline as shown in the diagram. What is the potential energy with respect to the bottom of the incline?



3. The bob of a pendulum has a mass of 2.0 kg and hangs 0.50 m above the floor. The bob is pulled sideways so that it is 0.75 m above the floor. What is its potential energy with respect to its equilibrium position?



4. A 2.00×10^3 kg crate is pushed to the top of an incline as shown. If the force applied along the incline is 12000 N, what is the potential energy of the object when it is at the top of the incline with respect to the bottom?



(Ok smartypants how much energy was wasted as heat?)

5. A 3.0 kg barrel is traveling at a constant speed of 7.5 m/s. What is its kinetic energy?
6. The kinetic energy of a 20.0 N box is 5.00×10^2 J. What is the speed of the box?

7. A 10.0 N apple is accelerated from rest at a rate of 2.5 m/s^2 . What is the kinetic energy of the apple after it has accelerated over a distance of 15.0 m.

8. A 1200.0 N sumo wrestler jumps off a cliff on Earth. What is its kinetic energy after it falls for 4.50 s?

9. An 8.0 kg object is dropped from a height of 7.0 m. What is the kinetic energy of the object just before it hits the ground? (No kinematics!)

10. A 9.00 kg object falls off of a 1.2 m high table. If all of the objects potential energy is converted into kinetic energy just before it hits the floor, how fast is it moving? (Solve without using kinematics)

11. A golfer wishes to improve his driving distance. Which would have more effect:
 (a) doubling the mass of his golf club or
 (b) doubling the speed with which the clubhead strikes the ball?

Explain your answer.

Answers: 1) 52.5 J 2) 189 J 3) 4.9 J 4) 1.18×10^5 J (26000 J) 5) 84 J 6) 22.1 m/s 7) 38 J 8) 119 000 J 9) 550 J 10) 4.8 m/s 11) b