

What is the formula for calculating gravitational potential energy? Define each variable. PE=min m=mass g=gravity h=height 7. If an object has 15 J of potential energy at a height of 50 cm, how much PE will it have if raised to a height of 100 cm? 305 8. If the object in the previous question is dropped to the ground, how much kinetic energy will it have at the instant before it hits the ground, assuming air friction is so small that we can ignore it? 301 9. If one object has 200 J of PE when raised to a certain height, how much PE will a second object have at the same height if the second object has half the mass of the first object? PE=mgh 1001. 10. An energy car is elevated to the top of a ramp What is true about the energy of the car? has PEgran. 11. The energy car is released from the top of the ramp and rolls down the ramp. What is true about the energy of the car? IE grow -> KE 12. The energy car bounces off a rubber band at the bottom of the ramp and rolls back up the ramp X . a. How far will the car roll back up the ramp? Not as high as release pt. b. Why will it behave in this way (in terms of energy)? 5/c some energy is "lost" to friction (heat) 13. What is the relationship between the work done to an energy car and the speed that it attains on the track?

14. A train traveling at 5 m/s has 10,000 J of KE.

a. How much KE will it have if velocity increases to 10 m/s?

 $k = 1, m v^2 \quad v = 40,000 \text{ J}$ 

b. Does doubling the velocity double the KE? Why or why not?

$$2^{2} = 4$$

For any calculation that you show below, carry out these steps:

- Write the formula that you will use to solve the problem
- Re-write the formula, substituting known values with units
- Write the answer using the proper unit
- Check you answer for the proper number of significant figures
- Check you work for accuracy

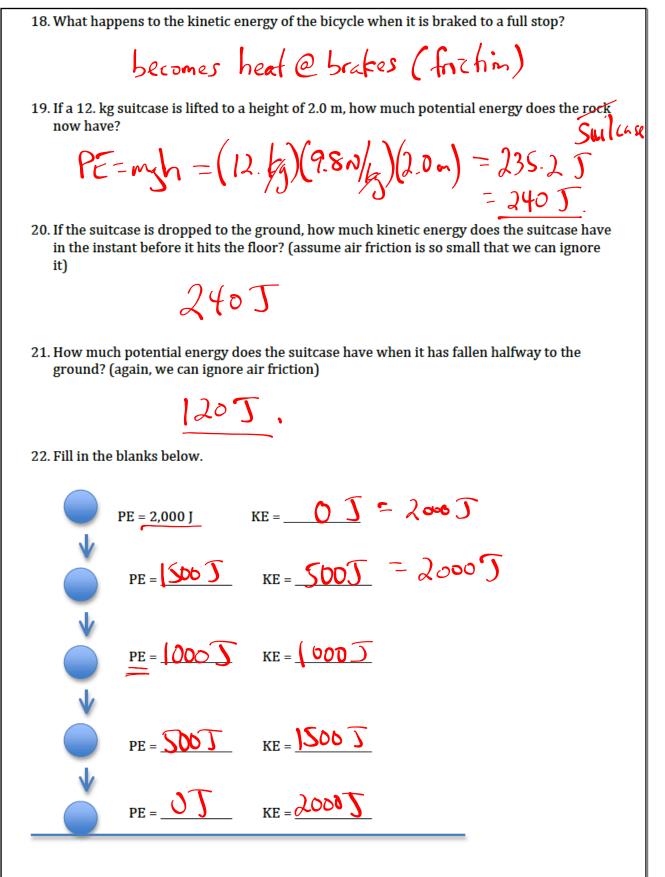
15. A 25.0. kg bicycle is moving at 7.0 m/s. How much kinetic energy does the bicycle have?

KE=1/mr = (25.0 kg)(7.0 m/s) 1/2 (25.0 kg)(49 m/s) = 613 J (0)

16. If the bicycle increases its speed to 14. m/s, how much kinetic energy does the bicycle now have?

2500  $KE = 1 m v^2 = 1 (25.0 k) (14. m/s)^2$ = 1/2 (25.0 k) (196 m/s) =

17. Does doubling the velocity of the bicycle double the kinetic energy of the bicycle? Why or why not? ND/- Quedaples - Velocity - (2)



February 24, 2015

