Work and Energy with Ek and Ug

1. Find the work done by a 25N force on an object that moves 4m, if the force and motion are in the same direction.

2. Find the work done by a 25N force on an object that moves 4m, if the force and motion are in opposite directions.

3. Find the kinetic energy of a 6kg object moving at 2m/s.

4. Find the kinetic energy of a 6kg object moving at 4m/s.

5. Find the kinetic energy of a 6kg object moving at 8m/s.

6. Find the kinetic energy of a 6kg object moving at 16m/s.

7. Sketch a graph of Kinetic Energy vs. Speed for a 6kg object.

8. Find the kinetic energy of a 500**g** object moving at 12m/s.

9. Find the speed of a 4kg object with 12J of kinetic energy.

10. Find the speed of a 265kg object with 12J of kinetic energy.

12. Find the gravitational energy of a 5kg object 2m above the surface of Earth.

13. Find the gravitational energy of a 125kg object 15m above Earth.

14. How high would you need to lift a 4kg object to give it 100J of gravitational energy?

15. How much work would you need to do to accelerate a 10kg object from rest (0m/s) to 4m/s?

16. How much work would you need to do accelerate a 10kg object from 4m/s to rest?

17. How much work would you need to do to lift a 10kg from the floor onto a 2.0m high shelf?

18. How much work would you need to do to lower a 10kg object from a 2.0m high shelf to the floor?

19. How much work would you need to do to push a 12kg object, from rest, to a speed of 4m/s up a 3m high ramp?

20. How much work would you need to do to move a 40kg object from rest to 4m/s while moving DOWN a 3m high ramp?

21. A 3.0kg object is moving at 2.0m/s on level ground. A 15N force acts in the direction of motion on the object over 4m. Find the final speed of the object.

22. A 3.0kg object is moving at 10.0m/s on level ground. A 15N force acts opposite the direction of motion on the object over 4.0m. Find the final speed of the object.

23. How much force would you need to apply to lift a 10kg mass straight up onto a 2.0m high platform, at constant speed?

24. How much force would you need to apply to push a 10kg mass onto a 2.0m high platform using a 10m long frictionless ramp, at constant speed?

25. Assuming no air resistance, how fast will a 5kg mass be moving if it falls 10m from rest?

26. Assuming no air resistance, how fast will a 10kg mass be moving if it falls 10m from rest?

27. Assuming no air resistance, how fast will a 1250kg mass be moving if it falls 10m from rest?

28. Assuming no air resistance, how fast will a 1 357 255kg mass be moving if it falls 10m from rest?

29. Do you get the point?

30. A ball is thrown straight up at 12m/s. How high will it go?

31. A roller coaster rolls down a 12.0m high hill and then up a 5.00m hill. The speed of the roller coaster at the crest of the 12.0m high hill was 1.32m/s. Assuming no friction find the speed of the cart at the top of the 5.00m hill. **(make a drawing!)**

32. A 125kg roller coaster cart rolls from rest, down a 9.2m tall hill. At the bottom it has a speed of 11m/s. How much work was done by friction? **(make a drawing!)**

33. A 125kg roller coaster cart rolls from rest, down a 9.2m tall hill. At the bottom it has a speed of 11m/s. How much energy was lost to the surroundings?

34. A 125kg roller coaster cart rolls from rest, down a 9.2m tall hill. At the bottom it has a speed of 11m/s. How much energy was released as heat and sound?

35. A 4.0kg block is pushed up at ramp at 12m/s and released. The block rises to a height of 5.0m above the point of release. How much energy was lost to the surroundings? **(make a drawing!)**

36. A 4.0kg block is pushed up at ramp at 12m/s and released. The block rises to a height of 5.0m above the point of release. How much energy was released as heat/sound?

37. A 4.0kg block is pushed up at ramp at 12m/s and released. The block rises to a height of 5.0m above the point of release. How much work was done by friction?

38.

30.0N

6.0m

2.0m

The object shown above has a mass of 6.0kg and is initially at rest at the bottom of an incline. A 30.0N force pushes the object, parallel to the surface, for a distance of 6.0m. Assuming negligible friction, find the final speed of the mass.

39.

40.0N

6.0m

2.0m

The object shown above has a mass of 6.0kg and is initially at rest at the bottom of an incline. A 40.0N force pushes the object, parallel to the surface, for a distance of 6.0m. Assuming a 15N frictional force exists between the mass and the surface, find the final speed of the mass.