Work and Energy: Take 2, Part 2 KEY.

**Practice Questions:**

1. Find the kinetic energy of a 12kg object travelling at 4m/s. **96J**

2. Find the kinetic energy of a 6kg object traveling at 5m/s. **75J**

3. Find the kinetic energy of a 237kg object travelling at 43.7m/s. **226298.265J**

4. Find the kinetic energy of a 500g object travelling at 9m/s. **20.25J**

5. Find the kinetic energy of a 180g object travelling at 250m/s. **5625J**

6. A 14kg mass has a speed of 22m/s. What is its kinetic energy? **3388J**

7. A 3.0kg object is moving at 19m/s. What is its kinetic energy? **541.5J**

8. A 547g object is falling straight down at 56m/s. What is its kinetic energy? **857.696J**

9. An object is travelling at 2m/s. The object has 24J of kinetic energy. What is its mass? **12kg**

10. An object is travelling at 5m/s. The object has 100J of kinetic energy. What is its mass? **8kg**

11. Find the mass of an object that has 200J of kinetic energy when travelling at 10m/s. **4kg**

12. A 4kg object has 32J of kinetic energy. What is its speed? **4m/s**

13. A 10kg object has 500J of kinetic energy. What is its speed? **10m/s**

14. How fast must a 200kg mass move to have 900J of kinetic energy? **3m/s**

15. How fast is a 125kg mass moving if it has 2378J of kinetic energy? **6.17m/s**

16. What is the speed of a 250g mass with 60J of kinetic energy? **21.9m/s**

17. What is the speed of a 45kg mass with 0.75J of kinetic energy? **0.18m/s**

18. How much gravitational energy does a 4kg mass have when resting 2.0m above the ground? **80J**

19. How much gravitational energy does a 4kg mass have when resting 10.0m above the ground? **400J**

20. How much gravitational energy does a 16kg mass have when resting 3.0m above the ground? **480J**

21. How much gravitational energy does a 110g mass have when resting 14m above the ground? **15.4J**

22. How much gravitational energy does a 4kg mass have when resting 1.0m above the ground? **40J**

23. What is the height of a 12kg mass with 360J of gravitational energy? **3m**

24. What is the height of a 9kg mass with 1250J of gravitational energy? **13.9m**

25. A 100kg mass has 14000J of gravitational energy. What is its height? **14m**

26. A 30N force acts on an object in the direction of motion for 3m. How much work is done? **90J**

27. A 30N force acts on an object in the direction of motion for 3m. How much does the energy of the object change? **90J**

28. A 30N force acts on an object opposite the direction of motion for 3m. How much work is done? **-90J**

29. A 30N force acts on an object opposite the direction of motion for 3m. How much does the energy of the object change? **-90J**

30. A 60N force pushes an object from rest for 12m. How much work is done? **720J**

31. A 200N force slows an object down over 7m. What is the change in energy? **-1400J**

**Type 5 Problems:**

1. A 178kg rollercoaster cart is at rest at the top of a 12m tall hill. The cart rolls down the hill and up a 4.0m high hill where its speed is 10m/s. What is the change in energy? **-5340J**

2. A 178kg rollercoaster cart is at rest at the top of a 12m tall hill. The cart rolls down the hill and up a 4.0m high hill where its speed is 10m/s. How much energy was lost? **5340J**

3. A 178kg rollercoaster cart is at rest at the top of a 12m tall hill. The cart rolls down the hill and up a 4.0m high hill where its speed is 10m/s. What is the work done by friction? **-5340J**

4. A 178kg rollercoaster cart is at rest at the top of a 12m tall hill. The cart rolls down the hill and up a 4.0m high hill. In the process 4240J of energy is lost as heat and sound. Find the speed of the cart at the top of the 4.0m hill. **10.6m/s**

5. A 2680kg rollercoaster is at rest at the top of an 8m tall hill. The cart rolls down the hill and up a 5m high hill. In the process 10 000J of energy is lost as heat and sound. Find the speed of the cart at the top of the 5m hill. **7.2m/s**

6. A 178kg rollercoaster cart is at rest at the top of a 12m tall hill. The cart rolls down the hill and up a 4.0m high hill. In the process 4240J of energy is lost as heat and sound. Find the speed of the cart at the top of the 4.0m hill. **10.6m/s**

7. How much work must be done to move a 40kg cart from rest to 8.0m/s on level ground with no friction? **1280J**

8. A 200N force is used to push a 20kg mass from rest up a ramp. The force acts for 12m and the object is raised to a height of 4.0m. What is the speed of the object at the top of the ramp, assuming no friction?

 **12.6m/s**