Introduction to Kinetic and Gravitational Energy

**KINETIC**

1. Find the kinetic energy of a 4.0kg mass moving at 5.0m/s

2. Find the kinetic energy of a 2.0kg mass moving at 8.0m/s

3. Find the kinetic energy of a 12kg mass moving at 4.0m/s

4. Find the kinetic energy of a 0.20kg mass moving at 10m/s

5. Find the kinetic energy of a 6kg mas moving at 13m/s

6. Find the kinetic energy of a 700g object moving at 9m/s

7. Find the kinetic energy of a 2222g object moving at 17m/s

8. Find the kinetic energy of a 820g object moving at 16m/s

9. A 62g mass has a speed of 699m/s. Find its kinetic energy.

10. A 14kg mass is moving at 100km/h. Find the kinetic energy.

11. An 8 kg mass has 100J of kinetic energy. Find the speed.

12. A 12kg mas has 24J of kinetic energy. Find the speed.

13. A 100kg object has 5000J of kinetic energy. Find the speed.

14. A 200g object has 4.9J of kinetic energy. Find its speed.

**GRAVITATIONAL**

1. A 2.0kg mass is 10m above the ground. What is the gravitational energy?

2. A 5.0kg mass is 4m above the ground. What is the gravitational energy?

3. A 100kg mass is 10m above the ground. What is the gravitational energy?

4. A 0.50kg mass is 3m above the ground. What is the gravitational energy?

5. A 33.744kg mass is 19.621m above the ground. What is the gravitational energy?

6. A 17kg mass is 0.056m above the ground. What is the gravitational energy?

7. A 410g mass is 8m above the ground. What is the gravitational energy?

8. A 2.0kg mass is 97cm above the ground. What is the gravitational energy?

9. A 125g mass is 244cm above the ground. What is the gravitational energy?

10. A 14kg mass has 633J of gravitational energy. What is its height?

11. How high would you need to lift a 1.2kg mass to increase its gravitational energy by 10J?

12. How much would you need to lower a 25kg bag of sand to decrease its gravitational energy by 0.80kJ

13. A mass is raised up 26m. This increased its gravitational energy by 70.07kJ. What is the mass?

Kinetic and Gravitational Energy

1. Find the kinetic energy of a 6.00kg object travelling east at 4.00m/s.

2. Find the gravitational potential energy of a 6.00kg object 4.00m above the ground (assume that the ground is at h=0m)

3. Find the mechanical energy of a 6.00kg object 4.00m above the ground (assume that the ground is at h=0m), travelling at 4.00m/s.

4. Find the change in kinetic energy of a 500.0g mass that accelerates from 4.00m/s to 6.00m/s.

5. Find the change in kinetic energy of a 500.0g mass that accelerates from 6.00m/s to 4.00m/s.

6. How much gravitational potential energy will a 25.0kg mass gain if it is lifted 2.00m up?

7. If a 25.0kg mass is dropped from rest from a height of 2.00m, how much kinetic energy will it have as it lands?

8. Find the speed reached by a 25.0kg mass that fall 2.00m from rest.

9. Find the maximum height reached by a ball thrown upward at 9.0m/s.

10. A mass slides, from rest, down a frictionless ramp from a height of 4.00m. Find the speed of the mass at the bottom of the ramp.

11. Find the total mechanical energy of a 138000kg jet flying at an altitude of 6.50**km** above the Earth at a speed of 148m/s.

12. 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!)**

13. Find the total mechanical energy (Ek+Epg) of a 138000kg jet flying at an altitude of 6.50**km** above the Earth at a speed of 462km/h.

14. A ball is thrown straight into the air at 14.0m/s. Find the maximum height reached by the ball.

15. A ball is thrown straight into the air at 14.0m/s. Find the height when its speed is 7.0m/s.

16. A ball is thrown straight into the air at 14.0m/s. Find the speed when it is 8.0m above the release point.