

Question 1- conservative

Old Faithful geyser in Yellowstone Park shoots water hourly to a height of 40 meters. With what velocity does the water leave the ground ?

- a. 7.0 m/s**
- b. 14.0 m/s**
- c. 19.8 m/s**
- d. 28.0 m/s**

Question 2 – nonconservative

A parachutist of mass 50 kg jumps out of an airplane at a height of 1000 m. The parachute deploys, and she lands on the ground with a velocity of 5 m/s. How much energy was lost to air friction during this jump?

- a. 49,375 J
- b. 98,750 J
- c. 197,500 J
- d. 489,875J

Question 3 - nonconservative

A girl and her bicycle have a total mass of 40 kg. At the top of the hill her speed is 5 m/s. The hill is 10 m high and 100 m long. If the force of friction as she rides down the hill is 20 N, what is her speed at the bottom?

- a. 5 m/s**
- b. 10 m/s**
- c. 11 m/s**
- d. She stops before she reaches the bottom.**

Question 4 - conservative

A pole vaulter clears 6 m. With what velocity does he strike the mat in the landing area?

- a. 2.7 m/s
- b. 5.4 m/s
- c. 10.8 m/s
- d. 21.6 m/s

Question 5 - conservative

A baseball catcher puts on an exhibition by catching a 0.15 kg ball dropped from a helicopter at a height of 101 m. What is the speed of the ball just before it hits the catcher's glove 1 m above the ground ?

- a. 44.3 m/s**
- b. 38.0 m/s**
- c. 31.3 m/s**
- d. 22.2 m/s**

Question 6 - power

A 1500 W hairdryer is connected in series with a 2500 W space heater and a 200 W boom box. If electric energy costs 10 cents per kWhr, how much does it cost to leave the hair dryer on for 20 minutes, the space heater for 12 minutes and the boom box for 5 hours ?

- a. 60 cents**
- b. 20 cents**
- c. 10 cents**
- d. 5 cents**

Question 7 - nonconservative

Preston pushes a 500 N wheelbarrow to the top of a 50 m ramp, inclined at 20 degrees with the horizontal, and leaves it. Tamara accidentally bumps the wheelbarrow. It slides back down the ramp, during which a 80 N frictional force acts on it over the 50 m. What is the wheelbarrow's kinetic energy at the bottom of the ramp ?

- a. 4550 J**
- b. 6550 J**
- c. 8150 J**
- d. 13100 J**

Question 8 – conservative

A 55.1×10^3 kg aircraft is flying at 900 km/hr
at a height of 10km.

What is its energy (kinetic and potential) ?

- a. 4,850 MJ
- b. 7,130 MJ
- c. 8,180 MJ
- d. 10,340 MJ