Homework 6

Alex Wyner

11/11/2022

Reading Check:

2) Quantity force multiplied by distance is referred to as work.

4) Since lifting a 50 kg sack a vertical distance of 2 m is half the distance but double the weight of lifting a 25 kg sack 4 m, it is the same amount of work.

7) A car raised twice as high has twice as much potential energy as a car raised to the original height.

10) Four times the work is required to double the speed of a car.

Plug and Chug:

38) ΔKE = KEf -KEi = .5\*mv2 – 0 = .5\*3\*42=.5\*3\*16=3\*8=24 J

39) ) ΔKE = KEf -KEi = Fnet \* d – 0 = 5000 \* 500 = 2,500,000 J

Think and Solve:

41) Work = GPE = mgh = 300 \* 9.81 \* 6 = 17,658 J

50) Using the law of conservation of energy, we know that the gravitational potential energy when the banana is at the top of the bridge is equal to the kinetic energy before the banana hits the water, since energy cannot be created or destroyed; or GPE = KE. Therefore, mgh = .5\*mv2, gh = .5\*v2, 2gh = v2, sqrt(2gh) = v.

Think and Explain:

68) The kinetic energy of a pendulum is at its greatest when it is at the bottom of its arc. Conversely, its potential energy will be at its greatest at the highest point in the arc. When its KE is at half its maximum value, its PE is equal to its PE at the center of the swing plus half of its maximum KE.

80) The KE of a ball thrown straight up in the air will be at its greatest right after it leaves the hand of the thrower, or at the bottom of its fall back to the ground. Its GPE will be at its greatest at the peak of its flight at its maximum height.