**Physics 20 – Lesson 27**

**Conservation of Energy**

possible 57 /53

1)

/3



2)

/3



3)

/4



4)

/4





5)

/3

The roller coaster is frictionless, therefore the total mechanical energy (Ek + Ep) remains constant. In other words the total mechanical energy at B, C and D is equal to the mechanical energy at A.

At B

6)

/9



At C



At D





7)

/4

At B



B

2.0 x 103 kg

14 m/s

25 m

A

C

36 m

8)

/8

At C

There are many ways to approach this problem. I chose the idea that if Ek at C is greater than zero the car will fall off at C.



EkC is negative, therefore the car never reaches point C. The engineer lives!! (Oh well.)

9)

/6





First, calculate the amount of energy involved in braking

10)

/5



Using the braking energy we can calculate how fast the car was going



∴the car was going slower than the 100 km/h speed limit



11)

/4



12)

bonus

/4