200 kg

150 m

90 m

120 m

140 m

Part I: Calculations <u>without</u> Friction: Show your Work!

Formula's: Work = F D cosθ Work = ½ kx^2 PE = mgh   KE = ½ mv^2 Power = work/time F_{fr} = μF_N

Loss of PE = Gain in KE (without friction)   Loss in KE = Gain in PE (without friction)
Loss of PE = Gain in KE + Frictional Work   Loss in KE = Gain in PE + Frictional Work

1. Calculate the PE at all points: *Answers: [W=294,000J; X=19,600J; Y=117,600J; Z=58,800J] (2 pts. each)*

   W: Ans: _____

   X: Ans: _____

   Y: Ans: _____

   Z: Ans: _____

2. Calculate the Velocity at all points: *Answers: [X=52.38 m/s; Y=42 m/s; Z=48.5 m/s] (2 pts. each)*

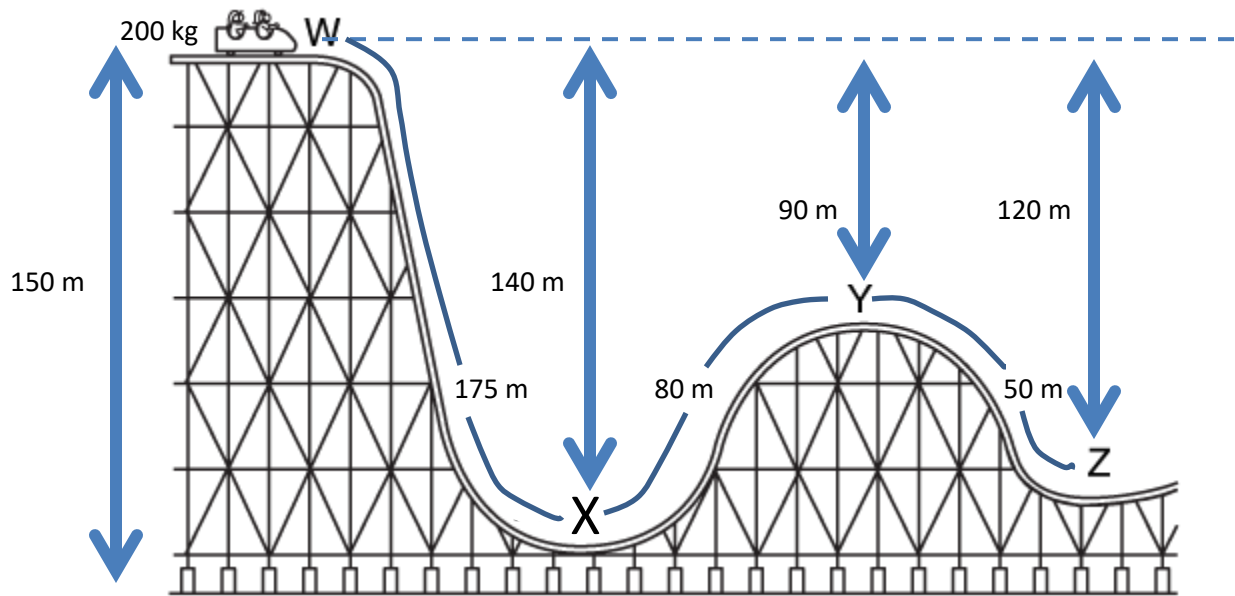   X: Ans: _____

   Y: Ans: _____

   Z: Ans: _____

200 kg W.

150 m

140 m

90 m

120 m

175 m

80 m

50 m

X

Y

Z

Part II: Calculation with Friction: Force of Friction is 350 N. Show all Work!

3. Calculate the Velocity at all points: *Answers: [X=46.17 m/s; Y=29.52 m/s; Z=35.84 m/s]* (5 pts. Each)

X: Ans: _____

Y: Ans: _____

Z: Ans: _____