The diagram below shows three points on a roller coaster track. A car starts from rest at point X and travels along the track. Assume friction is negligible.

a. Identify whether the car’s gravitational potential energy increases, decreases, or stays the same as the car moves from point X to point Y.

b. Identify whether the car’s kinetic energy increases, decreases, or stays the same as the car moves from point Y to point Z.

The car has a mass of 600 kg.

c. Calculate the gravitational potential energy of the car at its maximum height. Show your calculations and include units in your answer.

d. Calculate the maximum kinetic energy of the car. Show your calculations and include units in your answer.