Fahrenheit

For safety reasons, please do not take data collection devices on this ride. All the questions below can be answered through observation and utilization of the concepts of kinematics, work, power and special relativity.

 The height of the first hill is 37m. The speed at the bottom of the first hill is 26 m/s. This portion of the track is above the ground. Find the height of the track at the bottom of the hill. (Hint: Assume the velocity at the top of the first hill is zero.)

- 2. Putting on your physics hat, assume the acceleration of the train from the top of the first hill to the bottom is constant, the path is straight and disregard all the work the engineers put into the specific design of the drop.
 - a. Calculate the downward acceleration of the train. (Hint: To measure t, see Appendix B.)

b. Compare this to freefall by converting it to g's.

3.	Find the work needed to get the train of $m = 1000 \text{ kg}$ to the top of the first hill. (Hint: Assume the ascent is vertical.)
4.	Find the power needed to pull the train up. (Hint: To measure t, see Appendix B.)
5.	Fahrenheit uses drive wheels of r = 0.997m and chains to pull the ride up the hill. Now, since we're physicists and not engineers, we'll just assume one chain, one wheel, and one driving motor. How much torque must the drive wheel exert to pull up the car?