ORBIT

Qualitative

DATA:

Acceleration experienced at side of path when ride is fully vertical: _____________g's

Acceleration experienced at top of path when ride is fully vertical: _____________ g's

Acceleration experienced at bottom of path when ride is fully vertical: __________ g's

QUESTIONS:

1. When the ride first starts out, what is the angle between the cars and the main structure of the ride?

2. When the ride reaches full speed, but hasn't begun to "lift off", what is the angle between the cars and the ride? Is it 180º or something less? What keeps the cars from moving in a fully horizontal circle?

3. Where do the riders experience the greatest acceleration once the ride reaches its full vertical position? Where is it the least?

4. What is the difference between the two acceleration readings in #3? Use physics principles to explain why you get this difference.

5. While riding Orbit in the fully vertical position, where do you seem to be going the fastest? the slowest? Are you actually going different speeds? Explain why you seem to go different speeds. Relate this feeling to sensations you get on other rides.

ORBIT
Quantitative

DATA:
Radius of the ride: ______________ meters

Time for one revolution (T) when ride is at full speed:
____________sec

Acceleration experienced at side of path when ride is
vertical: _____________g's

Acceleration experienced at top of path when ride is
vertical: _____________ g's

Acceleration experienced at bottom of path when ride is vertical: _____________ g's

CALCULATIONS:
1. Calculate the circumference of the ride: _______________m

2. Calculate the velocity along the circumference: _____________m/sec

3. Calculate the centripetal acceleration (**v^2 / R**): _____________m/sec^2

4. Calculate the net acceleration at the top and bottom (calculating in gravity, + and -)

   Acceleration at top: ___________ m/sec^2 ___________ g's

   Acceleration at bottom: ___________ m/sec^2 ___________ g's

5. Compare your calculated values with the measured values on the ride.

6. What is the difference in the measured values at the top and bottom? Why did you get this particular difference?

Use the space around the sketch of Orbit above to sketch the forces acting on a person at the top of the ride and those acting on him/her at the bottom. These should relate directly to your answers to the set of calculations in number 4 above.