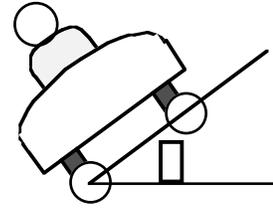


BERSERKER - AP



DATA:

Radius of ride (**R**): _____ m

Banking angle for track (θ): _____ degrees

Time for one revolution (**T**): _____ sec (at full speed)

Lateral acceleration (**a_L**): _____ g's (measured on the ride at full speed)

Vertical acceleration (**a_v**): _____ g's (measured on the ride at full speed)

In the problem that follows, ignore the fact that the entire ride is set at some angle to the horizontal. Consider the ride as if the rails were placed on a horizontal surface.

PROBLEM

There are two major reaction forces which act on a rider on **Berserker**.- reaction to gravity and reaction to inertia. Use the back of this page as needed for your work. Label your work!

1. Construct a free-body diagram to illustrate these two forces, showing their sum.
2. Use values taken when the ride is at full speed to determine what the banking angle should be for this ride so the net force is exerted normal to the seat of the speeding car.
3. Compare your value with the measured value for the banking angle of the cars when the ride is at full speed [% difference].
4. Evaluate the sizes you measured for vertical and lateral acceleration in light of the work that you've done in the first three steps. Were the accelerations reasonable, too big, or too small? Is the banking angle set properly?

P.S. By the way, how do you feel about the way the cars change their angle as they change their speed? Is this a reasonable way to build a ride?