

More vertical circles ... Centripetal Force $\Rightarrow F_g / F_N$

Amusement rides and stunts often have changing speeds so the centripetal force can also change.



What is it that determines the normal force on the rider?

When does the rider experience (apparent) weightlessness - free -fall?





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$$F_c = ???$$

Examples...

1. A roller coaster is at the top of a loop as shown. If the radius is 5.00m, what is the minimum speed that will keep the coaster on the track?

2. At the bottom of the loop, the normal force is equal to 2X the car's weight. How fast is it travelling?

3. What minimum speed must a roller coaster maintain when upside down at the top of a loop if the passengers are not to fall out?

4. How fast must a plane fly in a loop-the-loop stunt of radius 2.0km if the pilot experiences no force from either the seat or the safety harness when at the top of the loop? (To be considered 'weightless' the gravitational force must be entirely used up to provide the centripetal force.)

Just for You...

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