

# ENERGY & CENTRIPETAL FORCE

Units 14 & 11 Dr John P. Cise, Professor

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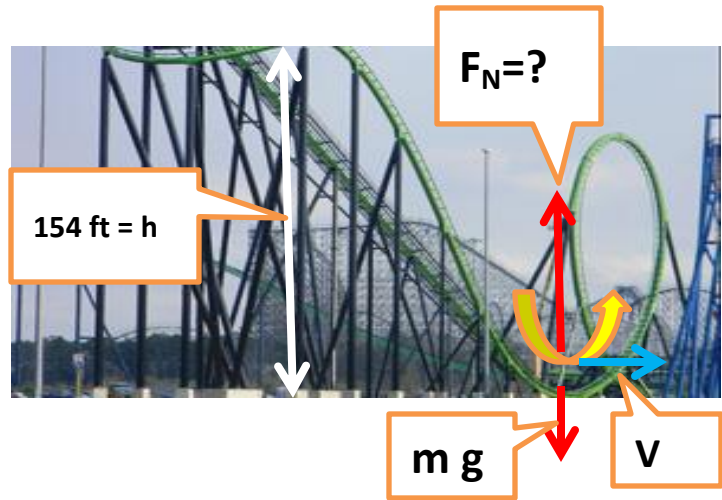
**QUESTIONS:** (a) Using energy concepts find the coaster's speed( $v$ ) at the bottom of 154 ft first hill? Assume friction is minimal.

(b) The radius of curvature of the first hill's bottom as seen at right is 121 ft. Find number of  $g$ s experienced by coaster riders at bottom of the first hill as seen at right?

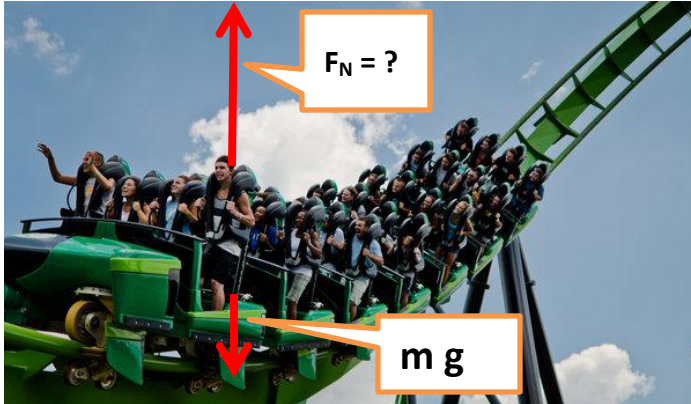
**HINT:** For part (b) find the normal force  $F_N$ . From the normal force  $F_N$  you can find the number of  $g$ s .

**ANSWERS:** (a)  $\sim 99.28$  ft/s

(b)  $\sim 3.47$   $g$ s or  $F_N = 3.47$   $mg$



What's Green and 154 Feet High?



FOR roller coaster enthusiasts, entering the parking lot of a theme park and getting that first glimpse of the coasters on its horizon can be nearly as thrilling as riding them. That view is particularly dramatic at Six Flags Great Adventure, a park tucked away in the woods here(Jackson, N J). Its perimeter is lined with variations of twisted, colored steel rising from the ground like skyscrapers. This summer an addition to the park's steadily evolving coaster skyline brings with it a bit of history. The ride is Green Lantern, after the comic book (and less so the film that failed to ignite much interest at the box office). Made up of a large, winding green track, the coaster requires riders to gather their courage and stand up for their two-and-a-half-minute thrill. Such rides are notoriously uncomfortable, but the Green Lantern, like its superhero namesake, comes with a little extra padding. **The coaster reaches a height of 154 feet**, and its first drop heads into the one part of the ride that isn't green: a yellow loop meant to signify the Parallax, a parasitic entity of fear that is Green Lantern's primary enemy. Riders go upside down five times, including once in a loop that is slightly tilted, almost as if it were about to fall over.