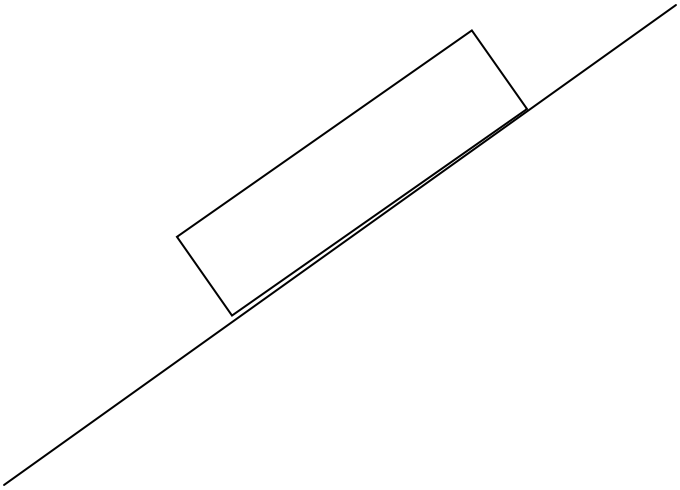
Name _____ Physics

The Physics of NASCAR

Racetracks use banked turns as this allows drivers to take the turns at higher speeds. In this activity we will investigate the banking angles of different professional racetracks and, combined with our knowledge of circular motion, will help us to learn more about the sport.

How it works



Write net force equations

Fast Facts:

World's Fastest Half Mile," 0.533-mile concrete oval

Degree of banking in corners: 36 degrees

Degree of banking in straights: 16 degrees

Straightaways: 650 feet long.

Concrete racing surface is 40 feet wide.

Seating capacity: 160,000

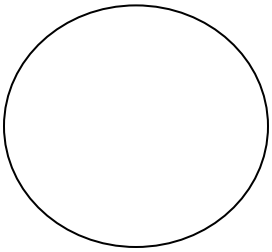
Distance:

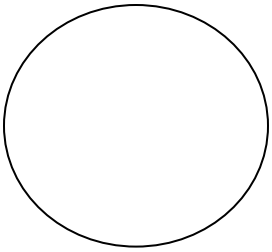
Winston Cup Series events: 500 Laps (266.5 miles)

Busch Series events: 250 Laps (133.25 miles)

Craftsman Truck Series events: 200 Laps (106.6 miles)

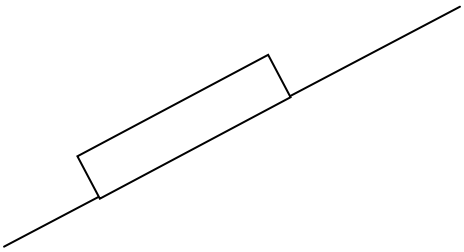
Goody's Dash Series events: 150 Laps (79.95 miles)





Draw a freebody diagram for a car making this turn.

Write net force equations



1. What is the radius of the banked turns? _____

2. What is the maximum speed that a car can take and still remain in the turn? Use coefficient of static friction between rubber and concrete.

3. What centripetal force does a 100 kg person experience traveling at 40 m/s through a turn?

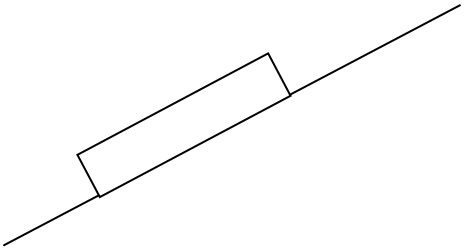
Daytona International Speedway Specifications

Superspeedway
2.5-mile trioval
40 feet wide with 12- to 30-foot apron

Turns
Banking: 31 degrees
Length: 3,000 feet
Radius: 1,000 feet

Draw a freebody diagram for a car making this turn.

Write net force equations



1. What is the maximum speed that a car can take and still remain in the turn? Use coefficient of static friction between rubber and asphalt.

2. What is the centripetal acceleration of a car making the turn at the maximum speed?

3. What centripetal force does a 100 kg person experience traveling at 40 m/s through a turn?