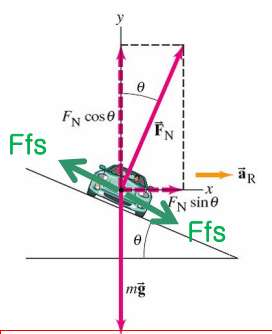
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**IDX G9 PHYSICS H STUDY GUIDE ISSUE 5**

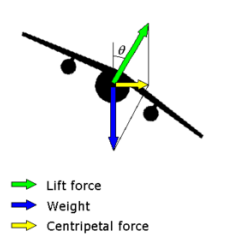
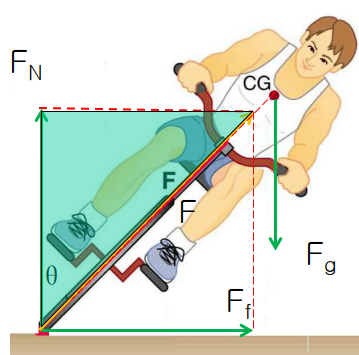
**By TaeYun K and Eric W**

**5-3: Highway Curves, Banked and Unbanked**

Unbanked Curves: Curves that are not sloped

1. When a car goes around a curve:
   1. is the centripetal force
      1. No = Car goes straight
      2. There is NEVER a Centrifugal force
2. If the is not sufficient, the car will tend to move more nearly in a straight line (due to Newton’s 1st law)
   1. As long as the tires don’t slip, the friction is static
   2. If they slip, the friction is kinetic, which is bad in 2 ways:
      1. The
      2. The points toward the circle center, but opposes that, making it difficult to regain control of the car & continue around the curve
3. Unbanked Curve’s Maximum Velocity:
   1. is independent of the mass of the car

Banked Curves:

1. Banked turns: using a slope/hill/angle to help us turn safely
2. Designed velocity for a banked curve with angle θ
   1. For every banked curve, there is one v where no friction is required
      1. (Design speed)
      2. If then increases the
      3. If then decreases the
      4. Banked v is also independent of the mass of the car
3. Why use banked turns?
   1. To allow us to not rely on friction when turning on a road
   2. To allow planes to turn (as they don’t have friction)
   3. To allow race cars to go at faster speeds
   4. To help with the wear and tear or your tires
4. Free body diagrams of:
   1. A car
   2. A plane
   3. A person on a bike

**5-6Newton’s Law of Universal Gravitation**

1. Statement
   1. A diagram of a circle with arrows and letters

      AI-generated content may be incorrect.Every particle in the universe attracts every other particle with a force that is proportional to the product of their masses and inversely proportional to the square of the distance between them. This force acts along the line joining the two particles
2. Formula:
   1. G = Universal Gravitational Constant = 6.67 × 10-11 Nm2/kg2
   2. Englishman Henry Cavendish measured the gravitational force between two objects in 1978
      1. Used device made by John Michell
      2. Cavendish intended to measure the density of Earth, but we can get G from that
   3. Conditions to apply the formula:
      1. Two **particles** separated distance r away
      2. **Extended** objects: **small size** compared to the distance **r**
      3. **Extended** objects: r and the size are **comparable**, then use **integral calculus**

A white paper with black text and black text

AI-generated content may be incorrect.

A paper with text and images

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