Flat & Banked Curves

Example Problems

Circular Motion: Review

- Newton's 2nd Law says: $\sum F = ma$
- When an object moves in a circle: $\sum F_c = m\frac{v^2}{r}$
- Velocity is related to period and frequency: $v = 2\pi rf = \frac{2\pi r}{T}$

**Reminder: $F_f = \mu F_N$

If the object is on FLAT ground: $F_N = mg$

Ex 1: Driving on a flat road

On a wet day, a car begins to slip on a curve of radius 42 m when its speed reaches 12.0 m/s. What is the coefficient of static friction between the tires and the road in this weather?

Ex 2: Banking angle

(a) For a car traveling with speed *v* around a curve of radius *r*, determine a formula for the angle at which a road should be banked so that no friction is required.

(b) In which direction will friction act if a car rounds the curve at a speed lower than v?