Banked Track Analysis

Concepts:

- FN: Normal Force
- Fg: Gravitational Force
- VFN: Velocity with Friction
- Banked Track: Consider scenarios with and without friction.
- Car Driving: Analyze the motion when driving toward us.
- Maximum Speed Without Sliding: Determine the conditions for maximum speed without losing traction.
- Minimum Speed: Calculate the minimum speed at which the mass can traverse around the circle.
- At the Top of the Circle: Note that $A + V_{\text{inion}}, F_1 = F_g$ at this point.

Equations and Calculations:

$$
\begin{aligned}
F_N &= F_g \\
F_g &= m \cdot a_c \\
\Sigma F_1 &= m a_c \\
F_g &= m \cdot v^2 \div r \\
mg &= m \cdot v^2 \div r \\
N &: \text{Normal force calculation} \\
v &= \sqrt{g \cdot r} = (\text{given } 4.5 \text{ m/s})
\end{aligned}
$$