**3PX3 Team 34 Tech Analysis 1**

Marcus

### Given Data:

* Mass (m) = 250 kg
* Spring Constant (k) = 105 N/m
* Damping Coefficient (b) = To be determined

### Suspension System Behavior:

1. Underdamped: Leads to oscillations, reducing passenger comfort and potentially affecting sensor accuracy.
2. Critically Damped: No oscillations and settles quickly, ensuring both stability and accurate sensor readings.
3. Overdamped: No oscillations but takes longer to settle, possibly affecting ride quality.

### Choosing the Best Suspension:

* Since the goal is to maintain stability, minimize vibrations, and improve sensor accuracy, a critically damped system is the best choice.
* Critically damped suspension ensures rapid stabilization after hitting a bump, reducing excessive movement and providing both passenger comfort and accurate sensor data.

### Recommended Solution:

Design the suspension system to be critically damped by tuning the damping coefficient b to the critical value: b = 2\*sqrt(m\*k)

Substituting the given values:

b = 2\*sqrt(250\*105)

b = 324 Ns/m

Thus, the optimal damping coefficient for a critically damped system is 324 Ns/m.