Vehicle:	**'19 BMW X6 sDrive35i**	**'85 Ford F250**
Vehicle mass, m	2079 kg	2612 kg
Vehicle yaw inertia, I_z	3200 kg·m^2	7910 kg·m^2
Wheelbase, l	2.93 m	3.385 m
Front weight %, $\frac{l_R}{l} \cdot 100\%$	49.1 %	57.1 %
Front cornering stiffness (front tires combined), C_{α_F}	80000 N/rad	110000 N/rad
Rear cornering stiffness (rear tires combined), C_{α_R}	90000 N/rad	100000 N/rad

For **each** vehicle:

1. Determine the **understeer gradient**, UG, and the **stability factor**, K.
2. Calculate the **characteristic speed** if the vehicle is understeer, or the **critical speed** if the vehicle is oversteer.
3. Making the simplifying assumption that the front and rear cornering stiffness do NOT change with weight distribution, determine the Front Weight % required to make the vehicle **neutral steer**.
4. Assuming that the total cornering stiffness, $C_{TOTAL} = C_{\alpha_F} + C_{\alpha_R}$, remains constant; determine the front cornering stiffness percentage required to make the vehicle **neutral steer**.
5. Determine the Front Weight % required to make the **characteristic speed** equal to 80 mph.
6. Determine the Front Weight % required to give the vehicle a **critical speed** of 40 mph.