CENTER OF MASS (AND CENTER OF GRAVITY)

● In Physics, sometimes it's useful to simplify SYSTEM of objects by replacing ALL objects with a single, equivalent object.

- This single object will have mass **M =** _____ and will be located at the system's _____:

→ Center of Mass Equation: X_{CM} = _____ = _____.

- If objects are in a 2D plane, we also have: Y_{CM} = _____ = _____.

EXAMPLE 1: Two masses are placed along the x-axis: mass A (10 kg) is placed at 0.0 m and mass B (20 kg) at 4.0 m. Find the Center of Mass of this system.

● A system's Center of GRAVITY is the same as its Center of MASS IF the gravitational field is _____.

- Unless otherwise stated, we assume gravitational fields are constant → so Center of Gravity = Center of Mass.

EXAMPLE 2: Three masses are placed on an X-Y plane: mass A (10 kg) is placed at coordinates (0, 0) m, mass B (8 kg) at (0, 3) m, and mass C (6 kg) at (4, 0) m. Find the X, Y coordinates for the Center of Mass of this system.