# *Sphere of Influence Problems*

# *Problem No. 01*

**Determine** earth related radii of **SOI** for **Moon & Mars.** ($M_{Earth} = 5.972 \times 10^{24}$ kg).

$$R_{E-Moon} = 3,86,000km; \quad R_{E-Mars} = 78,390,000km$$
$$m_{Moon} = 7.3477 \times 10^{22} kg; \quad m_{Mars} = 6.39 \times 10^{23} kg$$

# *Solution No. 01*

The **SOI** solutions are as **follows**.

$$r_{SOI-Moon} = 386000 \times \left( \frac{7.349 \times 10^{22}}{3 \times 5.975 \times 10^{24}} \right)^{0.333} = 61,791 km$$

$$r_{SOI-Mars} = 78390000 \times \left( \frac{6.442 \times 10^{23}}{3 \times 5.975 \times 10^{24}} \right)^{0.3333} = 25,871,960 km$$