

## Chapter 8 Problem 16 †

### Given

$$m_a = 67.0 \text{ kg}$$

$$m_s = 73,000 \text{ kg}$$

$$r = 84.0 \text{ m}$$

### Solution

Find the force between the astronaut and the shuttle.

The force of gravity is

$$F = G \frac{m_a m_s}{r^2}$$

$$F = (6.672 \times 10^{-11} \text{ Nm}^2/\text{kg}^2) \frac{(67.0 \text{ kg})(73,000 \text{ kg})}{(84.0 \text{ m})^2}$$

$$F = 4.62 \times 10^{-8} \text{ N} = 46.2 \text{ nN}$$

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†Problem from Essential University Physics, Wolfson