

1.2) The gravitational acceleration on a large planet is 90 ft/s^2 . What is the gravitational force acting on a spacecraft with a mass of 8000 lbm on this planet?

Solution:

Given: $a = 90 \text{ ft/s}^2$, $m = 8000 \text{ lbm}$, $F = ?$

The force acting on the spacecraft is

$$F = m \times a$$

$$F = 8000 \times 90 = 720000 \text{ lbm-ft/s}^2$$

or

$$F = 720000/32.2 = 22360.25 \text{ lbf}$$