6. The centripetal force necessary to keep the satellite in uniform circular motion is supplied by the gravitational attraction of the Earth for the satellite, so if we solve for the gravitational force we know the centripetal force. We cannot solve for the centripetal force directly using the definition of centripetal force, because we do not know the satellite's velocity.

$$F = G m_1 m_E / r^2$$

$$F = (6.67 \times 10^{-11} \text{ N m}^2 / \text{kg}^2) (500 \text{ kg}) (5.98 \times 10^{24} \text{ kg}) / (5 \times 6.37 \times 10^6 \text{ m})^2$$

$$F = (1.99 \times 10^{17}) / 1.01 \times 10^{15}) \text{ N m}^2 \text{ kg} / \text{kg}^2 \text{ m}^2$$

$$F = 197 \text{ N} = 44.3 \text{ lb}$$

You may be surprised by how small this force is.