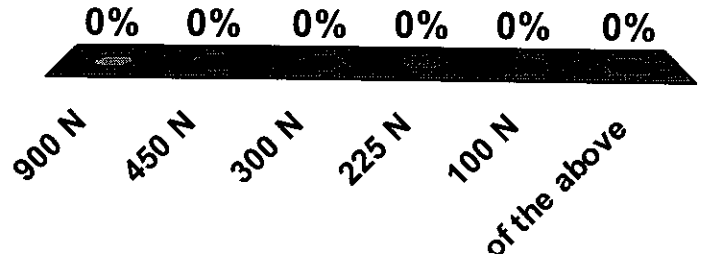
J. Griffin 10/10/07©

A satellite which weighs 900 N on earth is orbiting the earth at a fixed distance of 3 $R_E$ from the earth's center. What is the force that it feels at that point?

a) 900 N
b) 450 N
c) 300 N
d) 225 N
✔ e) 100 N
f) None of the above

J. Gritton 10/12/07(d)

# The correct answer is e) 100 N.

- If the object weighs 900 N on earth, the force of gravity which it feels there is $F_G$ = 900 N, and its distance from the center of the earth is D = 1*$R_E$.
- At a distance D' = 3*$R_E$, the gravitational force is inversely proportional to the square of the distance, and so it is reduced to $1/3^2$ = 1/9 of its value at earth's surface:

$$F'_G = 900/9 = 100 \text{ N}.$$