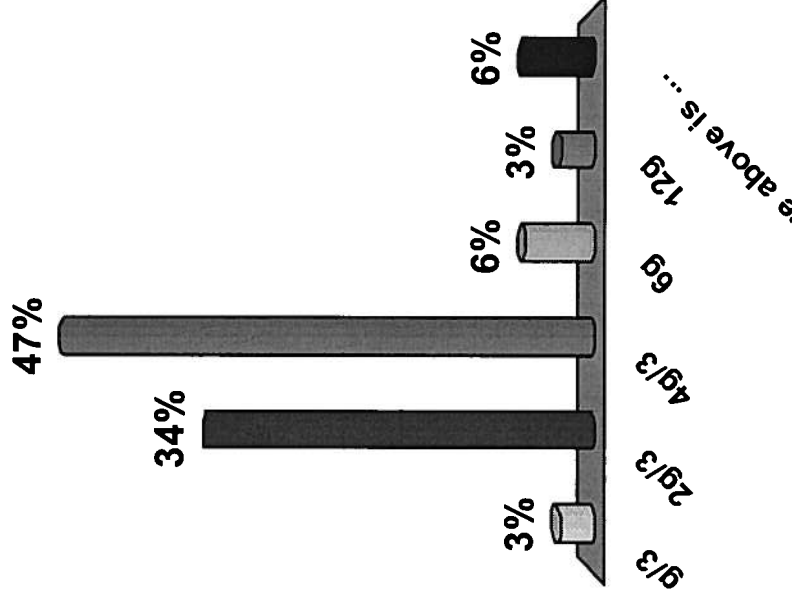


The acceleration, g_X , due to gravity near the surface of the planet, X, (whose mass is $M_E/3$ and whose radius is $R_E/2$) is, most nearly :

- a) $g/3$
- b) $2g/3$
- c) $4g/3$
- d) $6g$
- e) $12g$
- f) None of the above is correct within 10%.



The correct answer is c) $g_x = 4g/3$;
as follows.

- Since $g = G \cdot M_p / R_p^2$ is the acceleration of gravity at a distance, R_p , from the center of an object of mass, M_p , the ratio, (g_x / g_E) is given by:

$$\begin{aligned} g_x / g_E &= \{G \cdot M_x / R_x^2\} / \{G \cdot M_E / R_E^2\} \\ &= (M_x / M_E) (R_E^2 / R_x^2) \\ &= (1/3) \cdot (2^2). \end{aligned}$$

- Therefore, $g_x = 4g/3$.