48. (a) We use Eq. 16-29 and the parallel-axis theorem $I = I_{\text{cm}} + mh^2$ where $h = R = 0.125$ m. For a solid disk of mass m, the rotational inertia about its center of mass is $I_{\text{cm}} = mR^2/2$. Therefore,

$$T = 2\pi\sqrt{\frac{mR^2/2 + mR^2}{mgR}} = 2\pi\sqrt{\frac{3R}{2g}} = 0.869 \text{ s} .$$

(b) We seek a value of $r \neq R$ such that

$$2\pi\sqrt{\frac{R^2 + 2r^2}{2gr}} = 2\pi\sqrt{\frac{3R}{2g}}$$

and are led to the quadratic formula:

$$r = \frac{3R \pm \sqrt{(3R)^2 - 8R^2}}{4} = R \quad \text{or} \quad \frac{R}{2} .$$

Thus, our result is $r = 0.125/2 = 0.0625$ m.