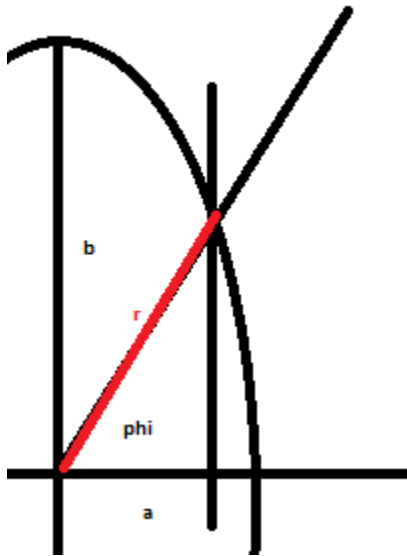My approach:

Phi being the angle:

The point on the ellipsoid is solved by solving the above derived equation for y:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

$$y = \sqrt{(1 - \frac{x^2}{a^2})b^2}$$

$$\therefore r_2 = \sqrt{x^2 + y^2} = \sqrt{x^2 + \sqrt{\left(1 - \frac{x^2}{a^2}\right)b^2}^2} = \boxed{\sqrt{x^2 + \left(1 - \frac{x^2}{a^2}\right)b^2}}$$