$R_{20}(r) = \frac{1}{(2a_0)^{3/2}}\left(2-\frac{r}{a_0}\right)e^{-r/2a_0}$

Radial prob. Density $= r^2|R(r)|^2$

$= \frac{r^2}{(2a_0)^3}\left(2-\frac{r}{a_0}\right)^2 e^{-r/a_0}$

$\frac{dP(r)}{dr} = \frac{d}{dr}\frac{1}{2a_0^3} r^2\left(2-\frac{r}{a_0}\right)^2 e^{-r/a_0}$

$= \frac{1}{2a_0^3}\frac{d}{dr}\left[\left(4r^2 - \frac{4r^3}{a_0} + \frac{r^4}{a_0^2}\right)e^{-r/a_0}\right]$

$= \frac{1}{2a_0^3}\left[\left(4r^2 - \frac{4r^3}{a_0} + \frac{r^4}{a_0^2}\right)\left(-\frac{1}{a_0}\right)e^{-r/a_0}\right.$

$\left. + \left(8r - \frac{12r^2}{a_0} + \frac{4r^3}{a_0^2}\right)e^{-r/a_0}\right]$