Quiz Week 4

In the lecture, we showed that all zero-mean unit-variance Gaussian vectors of length n, denoted by $\boldsymbol{X}$, 'live' very close to the surface of an n-dimensional sphere with radius $\sqrt{n}$. But where do zero-mean Gaussian vectors of length n and variance σ^2 'live'? Specifically, what is the radius of the n-dimensional sphere on whose surface these vectors live? Show a short proof of your claim.

On Moodle, upload the numerical value of your derived radius for $n = 100$ and $\sigma = 2$.