Below is a slightly modified version of the python code we used to study the infinite square well. As mentioned above, we now integrate from the left wall to the right wall and check if the wave function is zero at the right wall. Modify this code so that you can study the infinite **spherical** well.

You will need to be careful with how the effective potential behaves close to $r=0$. Instead of having it diverge as $r\to 0$ you could have it tend to a very large finite value.

Adjust the code so that you can set $a=1$ and $l=10$.

Submit all eigenvalues you find with $E<1000$.

Energies for the bound states are:
59.9584118
74.8336183
99.6255015
134.3344262
178.9593418
233.5003536
297.9567460
372.3289917
456.6148137
550.8181889
654.9340504
768.9614078
892.9053899

Finally, change your code (in the last box) to plot the 6th *excited* wave-function (i.e. the 7th wave-function if you count the ground-state) with $a=1$ and $l=10$. There is no need to plot the entire wave-function, just the radial part ($u(r)$) that the program is determining.