

## Quiz 2

Thursday, April 6, 2017 3:45 PM

Consider the following 2 hydrogen atom wavefns:

$$\boxed{n=1, l=0} \quad \Psi_{100}(\vec{r}) = A_1 e^{-r/a}$$

$$\boxed{n=2, l=0} \quad \Psi_{200}(\vec{r}) = A_2 \left(1 - \frac{r}{2a}\right) e^{-r/2a}$$

where  $A_1$  &  $A_2$  are normalization constants.

- Show that these two wavefns are orthogonal.

The following definite integrals may be useful:

$$\int_0^{\infty} x^2 e^{-x/x_0} dx = 2x_0^3$$
$$\int_0^{\infty} x^3 e^{-x/x_0} dx = 6x_0^4$$