

Reading: Boas 12.1 for an intro to the series method.

- (1) Use the series method to obtain the solution to the initial value problem

$$u'' + 9u = 0 \text{ with } u(0) = 1 \text{ and } u'(0) = 0$$

Name the function!

- (2) In our solution of the Schrödinger's equation for the harmonic oscillator we will see that the ratio of the b_n 's, in the limit of large n , scale as

$$\frac{b_{n+2}}{b_n} \simeq \frac{2}{n}.$$

Show that this is the same behavior as e^{x^2} .

Hint: Expand the exponential function in the series and show that it has the same behavior.