8.1.2

THE FIRST 3 LAGUERRE POLY'S ARE

$L_0 = 1$

$L_1 = 1 - x$

$L_2 = x^2 - 4x + 2$

SHOW THAT THESE ARE ORTHO OVER $x \in [0, \infty]$ RESPECTIVE TO WEIGHT FUNCTION

$w(x) = e^{-x} \longrightarrow \langle L_n, e^{-x} \rangle = 0$

$= 0 = \int_0^\infty L_n e^{-x} \, dx$

WHAT IF FOR

$\langle \alpha, \beta \rangle = \int_{-1}^{1} \alpha \cdot \beta \, dx$

ONE ATTACHED TO - eg. INTEGRAND.

$\langle \alpha, \beta \rangle = \int_{-1}^{1} \alpha \beta e^{-x} \, dx$

IF L_n LAGUERRE POLY'S ARE ORTHO TO INNER PRODUCT,

$\langle f, g \rangle = \int_0^\infty f(x) \, g(x) \, e^{-x} \, dx$

e^{-x} → WEIGHT

THEN IT MUST BE TRUE THAT ...

IF 'LAGUERRE POLYS' ARE L_n

$\longrightarrow \langle L_n, \langle f, g \rangle \rangle = 0$

...?

IE. OR