

The deflection of a mechanical beam is governed by the equation

$$Y \frac{d^4\psi}{dx^4} = p(x) \quad ; \quad 0 \leq x \leq L$$

where $\psi(x)$ is its static transverse deflection under the given load distribution $p(x)$, Y is the (constant) flexural rigidity parameter, and L is the beam's length. Suppose the boundary conditions are

$$\psi(0) = 0 \quad ; \quad \psi'(0) = 2\psi'(L) \quad ; \quad \psi(L) = a \quad ; \quad \psi''(0) = 0$$

where a is a given constant.

- (a) Determine the boundary value problem satisfied by the Green function $G(x)$;
- (b) Write the expression for the solution $\psi(x)$ in terms of an integral over G , and other known quantities. *Don't bother to solve explicitly for the Green function.*