

Homework #34

Problem HC: Generating Function (Goldstein 9-6b)

The transformation equations between two set of coordinates are

$$Q = \ln(1 + \sqrt{q} \cos p)$$
$$P = 2(1 + \sqrt{q} \cos p) \sqrt{q} \sin p$$

Show that the function that generates this transformation is

$$G_3(p, Q) = - (e^Q - 1)^2 \tan p$$