Special Problem 4-6.4

Consider the dipole shown below, where both charges lie on the x-axis.

The positive charge lies at a point with coordinate \( x = 0.999 \) m.

The negative charge lies at a point with coordinate \( x = 1.001 \) m.

At a point with coordinates \( x = 4 \) m, \( y = 4 \) m, and \( z = 0 \), the electric potential is equal to \(-\frac{12}{(\pi \varepsilon_0)}\) Volts.

Determine the value of dipole charge \( Q \). (Don’t be surprised if this answer is big!).