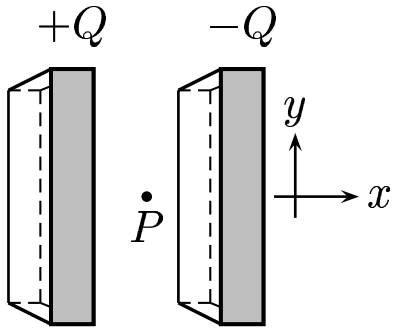
Consider an electrostatic situation. A parallel plate system has a plate charge $+Q$ on the left-hand plate and a plate charge $-Q$ on the right-hand plate. Each plate has an area A.



Determine the the electric field E_{gap} at P, within the gap.

A) $\vec{E} = \dfrac{Q}{\epsilon_0 A}$, to the right.

B) $\vec{E} = \dfrac{Q}{\epsilon_0 A}$, to the left.

C) $\vec{E} = \dfrac{2Q}{\epsilon_0 A}$, to the right.

D) $\vec{E} = \dfrac{2Q}{\epsilon_0 A}$, to the left.

The areal charge density is $\sigma = \dfrac{Q}{A}$, therefore

$$E_{gap} = \frac{\sigma}{\epsilon_0} = \frac{Q}{\epsilon_0 A}.$$

Answer **A**.