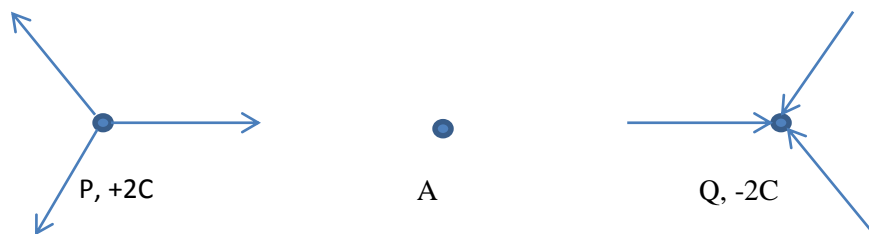
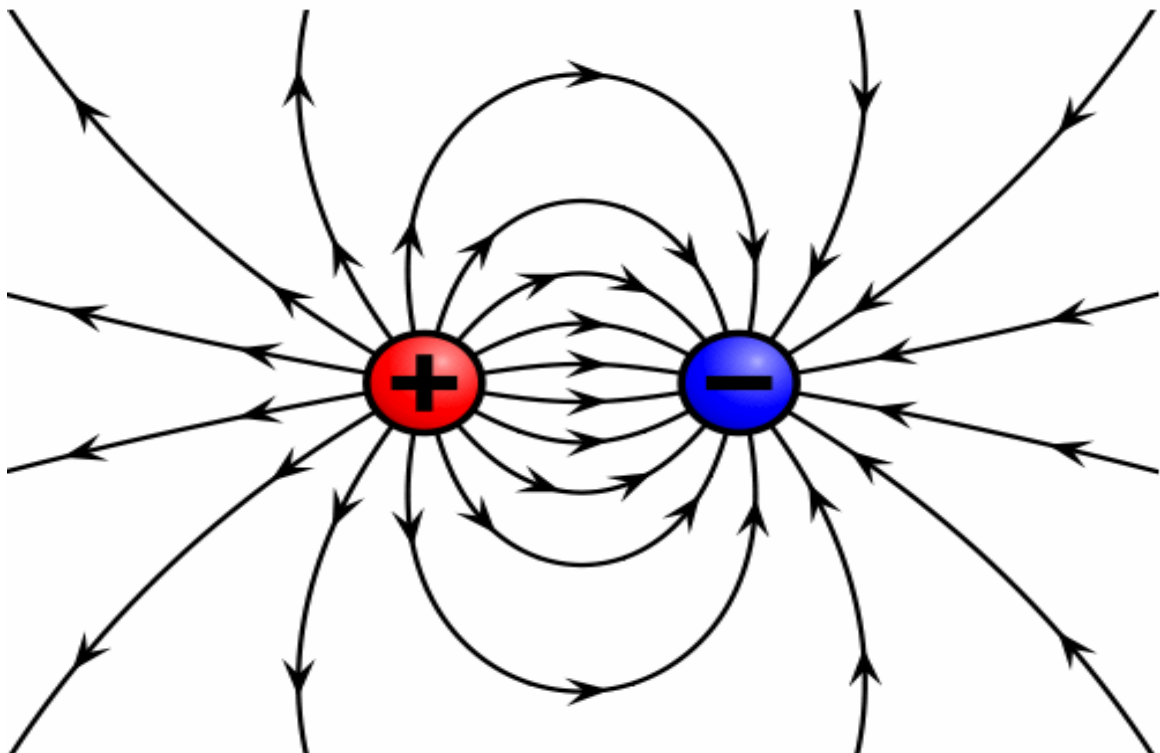


The total electric flux through a cylinder placed in an electric field with its axis parallel to the field is zero.⁸ Charges of $+2C$ and $-2C$ are situated at points P and Q respectively which are at a distance apart. A point X is mid-way between P and Q. Which of the following correctly describes the electric field and the electric potential at point X

- a. electric field is toward Q, electric potential is zero.
- b. electric field is toward Q, electric potential is negative.
- c. electric field is toward P, electric potential zero.
- d. electric field is toward P, electric potential is positive.



The electric field is directed away from positive charges and towards negative charges.



Therefore, electric field is toward Q at point A.

The electric potential created by a point charge Q, at a distance r from the charge can be shown to be:

$$V = \frac{kQ}{r}$$

For point A we have:

$$V_A = \frac{kQ}{r} + \frac{k(-Q)}{r} = 0$$

So, electric potential is zero at point A.

Answer: a. electric field is toward Q, electric potential is zero.