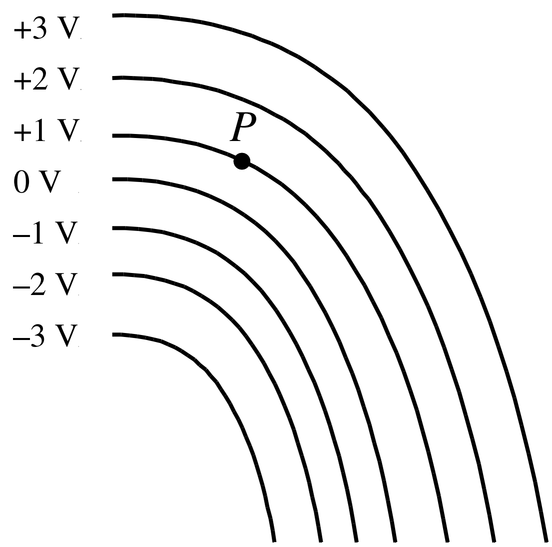
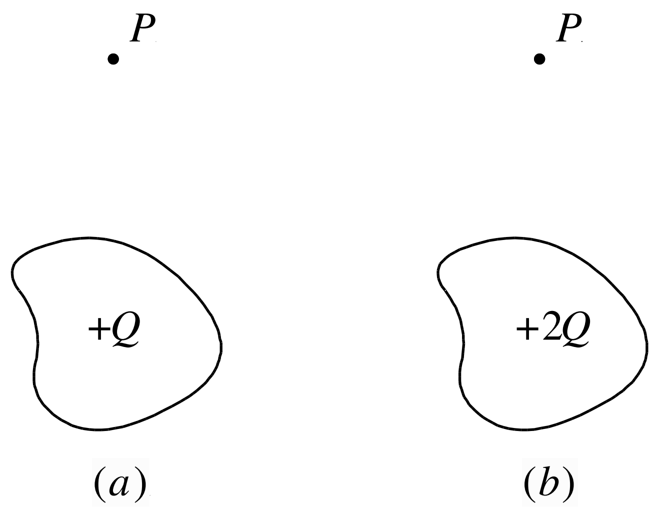
A small positive point charge is placed at point *P* in the electric field shown below. Which way should the charge be moved if no work is to be done on it as it moves?



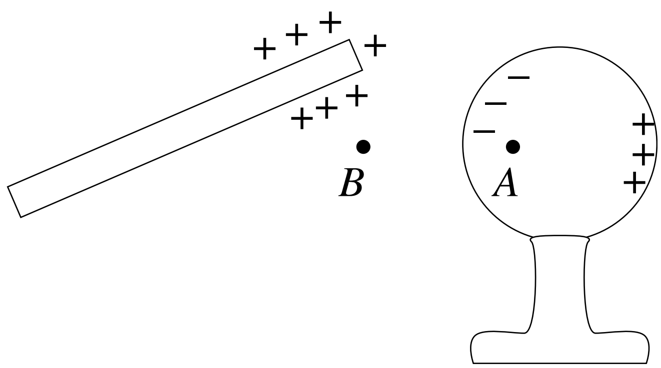
1. Along the 1-V equipotential.
2. Perpendicular to the equipotential lines
3. You canŠt avoid doing work, unless you move the charge along the 0 V equipotential line

Consider an arbitrarily shaped charged conductor (a). If we double the charge on the conductor (b), which of the following also doubles?



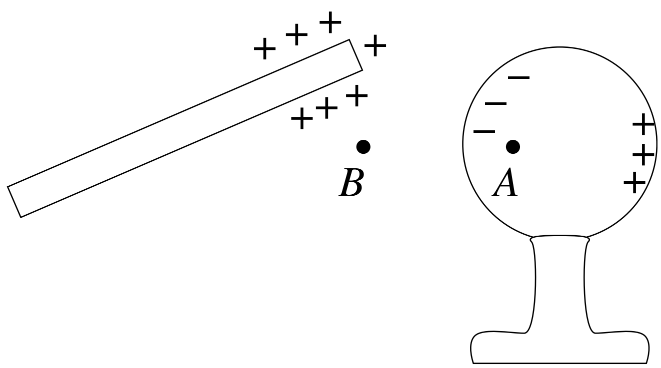
1. The electric field at point P
2. The potential at point P
3. Both of the above
4. Neither of the above

A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B. The electrostatic work done on the positively charged particle during the motion



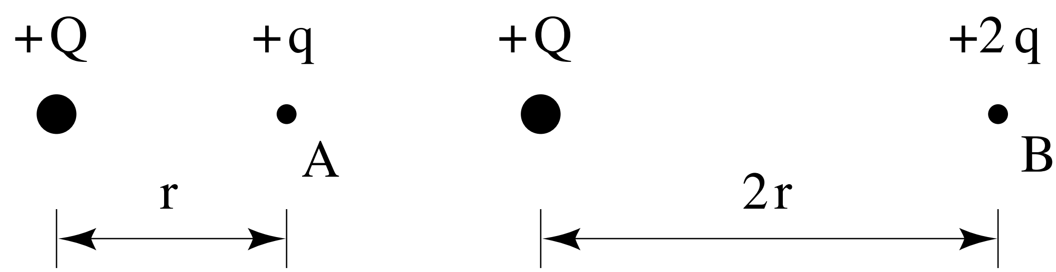
1. positive
2. zero
3. negative
4. depends on the path taken from $A$to B
5. depends on the particles change in kinetic energy
6. cannot be determined without knowing more about the polarization induced in the sphere

A positively charged rod is held near a neutral conducting sphere as illustrated below. A negatively charged particle is moved from point *A* to point *B* at constant speed. The mechanical work required to cause this motion is



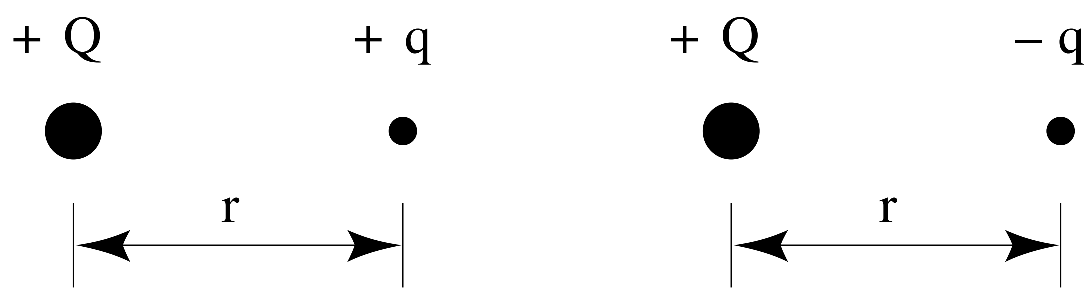
1. positive
2. zero
3. negative
4. depends on the path taken from *A* to *B*
5. cannot be determined without knowing more about the polarization induced in the sphere

Two test charges are brought separately into the vicinity of a charge $+Q$. First, test charge +q is brought to point A a distance r from $+Q$. Next, $+q$ is removed and a test charge $+2q$ is brought to point B a distance $2r$ from $+Q$. Compared with the electrostatic potential of the charge at A, that of the charge at B is



1. greater.
2. smaller.
3. the same.

Two test charges are brought separately into the vicinity of a charge $+Q$. First, test charge $+q$ is brought to a point a distance r from $+Q$. Then this charge is removed and test charge $-q$ is brought to the same point. The electrostatic potential energy of which test charge is greater:



1. $+q$
2. $-q$
3. It is the same for both.

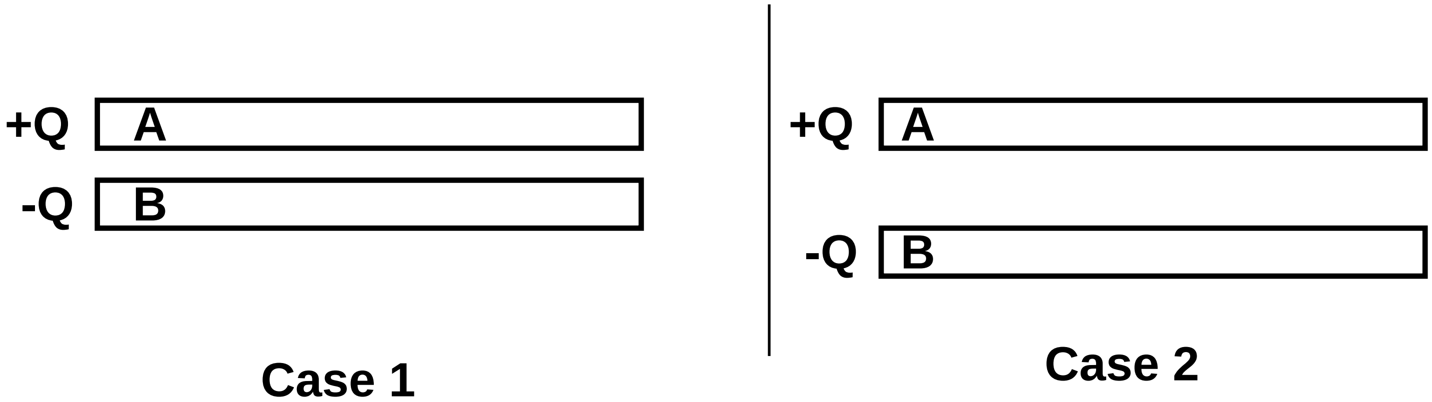
An electron is pushed into an electric field where it acquires a 1-V electrical potential. Suppose instead that two electrons are pushed the same distance into the same electric field. The electrical potential of the two electrons is

1. 0.25 V.
2. 0.5 V.
3. 1 V.
4. 2 V.
5. 4 V.

Consider two isolated spherical conductors each having net charge Q. The spheres have radii a and b, where $b > a$. Which sphere has the higher potential?

1. the sphere of radius a
2. the sphere of radius b
3. They have the same potential.

Two parallel conducting plates have charges +Q and –Q:



We measure the electric potential of plate A with respect to plate B. We find that

A) Case 1 has a higher electric potential.
B) Case 2 has a higher electric potential.
C) The electric potential is the same in the two cases.