

S-25-1

The gap between electrodes in a spark plug is 0.060 cm. To produce an electric spark in a gasoline-air mixture, an electric field of  $3.0 \times 10^6$  V/m must be achieved. When starting the car, what minimum voltage must be supplied by the ignition circuit?

S-25-16

A positron has the same charge as a proton, but the same mass as an electron. Suppose a positron moves 5.2 cm in the direction of a uniform 480 V/m electric field. How much potential energy does it gain or lose? How much kinetic energy?

S-25-22

A small spherical object carries a charge of 8.0 nC. At what distance from the center of the object is the potential equal to 100V? 50V? 25V? Is the spacing of the equipotentials proportional to the change in V?

S-25-26

A charge  $q$  ( $q > 0$ ) is at the origin. A charge  $-2q$  is at  $x = 2$  m on the  $x$ -axis. For what values of  $x$  is the electric potential equal to zero? the electric field equal to zero?

S-25-38

The electric potential (in volts) in a certain region is:

$$V = 4xz - 5y + 3z^2$$

Find the direction and magnitude of the electric field at the point  $P(2, -1, 3)$ , where all the distances are in meters.

S-25-51

How many electrons should be removed from an initially uncharged spherical conductor of radius 0.300 m to produce a potential of 7.50 kV at the surface? What would the potential be at the center of the sphere?