25-9 Calculating the field from the Potential

25-09
Question 584 0.55-54%
An infinite nonconducting sheet has a surface charge density 0.10*10**(-6) C/m**2 on one side. How far apart are equipotential surfaces whose potentials differ by 90 V?
(a) 2.0 cm.
(b) 1.6 cm.
(c) 0.88 cm.
(d) 1.8 cm.
(e) 2.5 cm.

25-09
Question 585 0.41-41%
The electric potential at points in an xy-plane is given by
V = 4.0*(x**2) - 5.0*(y**2),
where V is in volts, and x and y are in meters. What is the magnitude of the electric field at point (2.0 m, 3.0 m)?
(a) 15 V/m
(b) 28 V/m
(c) 25 V/m
(d) 31 V/m
(e) 34 V/m

25-09
Question 586 0.59-43%
The electric potential at point A in an electric field is 15 V smaller than at point B. If a charge q = -2.0 C is moved from A to B, then the electric potential energy of this charge will:
(a) increase by 30 J.
(b) decrease by 15 J.
(c) increase by 25 J.
(d) decrease by 30 J.
(e) increase by 15 J.

25-09
Question 587 0.50-64%
Two large, parallel, conducting plates are 20 cm apart and have charges of equal magnitude but opposite signs on their facing surfaces. An electron, placed anywhere between the two plates experiences an electrostatic force of 1.6*10**(-15) N. Find the magnitude of the potential difference between the two plates.
(a) 30 kV
(b) 50 kV
(c) 2 kV
(d) 10 kV
(e) 4 kV

25-09
Question 588 0.56-61%
The electric potential at points in the xyplane is given by: V = (x**3 - 2*x*y) Volts, where x and y are in meters. The magnitude of the electric field at the point with the coordinates x = 1 m and y = 2 m is:
(a) Sqrt(2) V/m.
(b) Sqrt(8) V/m.
(c) Sqrt(3) V/m.
(d) Sqrt(5) V/m.
(e) Zero.

25-09
Quest on 589 0.45-41%
The potential of a charge distribution is given by: V(x,y) = A [y*(x**2)- x*(y**2)], where A is in appropriate units. The electric field will be zero at the point:
(a) x = 0, and y = 0.
(b) x = 1, and y = -1.
(c) x = 0, and y = 1.
(d) x = 1, and y = 1.
(e) x = 1, and y = 0.

25-09
Quest on 590 0.55-44%
The electric potential in a certain region is given by: V = [2.00*(x**2)]-[3.00*(y**2)] where V is in volts and x and y are in meters. What is the magnitude of the electric field at the point (1.40 3.40)?
(a) 20.4 V/m
(b) 14.8 V/m
(c) 5.60 V/m
(d) 26.0 V/m
(e) 21.2 V/m

25-09
Question 591 0.51-61%
Points A [at (3,6) m] and B [at (8,-3) m] are in a region where the electric field is given by E = 12i (N/C), where i is a unit vector in the x direction. What is the electric potential difference VA-VB?
(a) -60 V
(b) +50 V
(c) -80 V
(d) +80 V
(e) +60 V

25-09
Question 592 0.19-81%
In figure 3, two large horizontal metal plates are separated by 4 mm. The lower plate is at a potential of -6.0 V. What potential should be applied to the upper plate to create an electric field of strength 4000 V/m UPWARDS in the space between the plates?

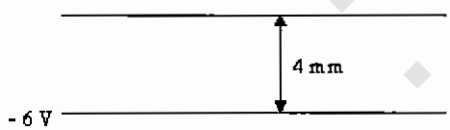

Figure (3)

(a) -16 V.
(b) 10 V.
(c) -10 V.
(d) -22 V.
(e) 22 V.

25-09
Question 593 0.36-62%
Over a certain region of space, the electric potential is give by: V(x,y) = x**2 +y**2 +2*x*y. Find the angle that the electric field vector makes with Z-axis at the point P(1.0,2.0,0.0)
(a) 75 degrees.
(b) 45 degrees.
(c) 90 degrees.
(d) 0 degrees.
(e) 60 degrees.