continued from previous page

PRACTICE PROBLEMS

42. Find the electric field due to a point charge of 4.2×10^{-7} C at a point 2.8 cm from the charge.

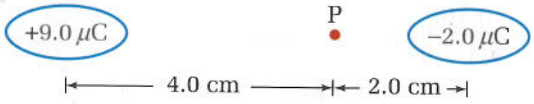
43. How far from a positive point source of 8.2 C will the electric potential difference be 5.0 V? (**Note:** 8.2 C is a very large charge!)

44. The electric potential difference due to a point charge is 4.8 V at a distance of 4.2 cm from the charge. What will be the electric potential energy of the system if a second charge of +6.0 μC is placed at that location?

45. The electric potential difference at a distance of 15 mm from a point charge is −2.8 V. What is the magnitude and sign of the charge?

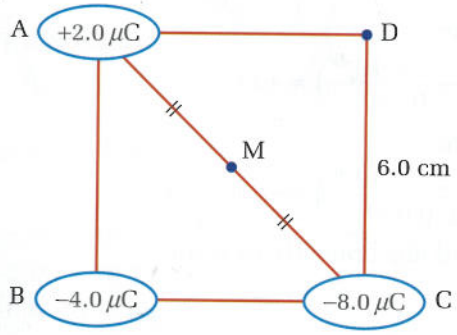
46. Point charges of +8.0 μC and −5.0 μC, respectively, are placed 10.0 cm apart in a vacuum. At what location along the line between their centres will the electric potential difference be zero?

47. What is the potential difference at point P situated between the charges +9.0 μC and −2.0 μC, as shown in the diagram.

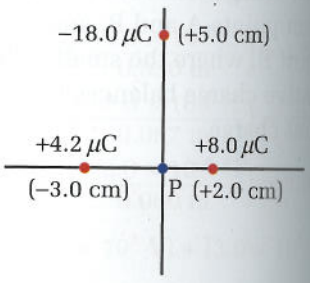


48. Point X has an electric potential difference of +4.8 V and point Y has a potential difference of −3.2 V. What is the electric potential difference, ΔV, between them?

49. Charges of +2.0 μC, −4.0 μC, and −8.0 μC are placed at three vertices of a square, as shown in the diagram. Calculate the electric potential difference at M, the midpoint of the diagonal AC.



50. The diagram shows three small charges located on the axes of a Cartesian coordinate system. Calculate the potential difference at point P.



51. Two charges are placed at the corners of a square. One charge, +4.0 μC, is fixed to one corner and another, −6.0 μC, is fixed to the opposite corner. What charge would need to be placed at the intersection of the diagonals of the square in order to make the potential difference zero at each of the two unoccupied corners?

52. Point A has an electric potential difference of +6.0 V. When a charge of 2.0 C is moved from point B to point A, 8.0 J of work are done on the charge. What was the electric potential difference of point B?

53. The potential difference between points X and Y is 12.0 V. If a charge of 1.0 C is released from the point of higher potential and allowed to move freely to the point of lower potential, how many joules of kinetic energy will it have?

54. Identical charges of +2.0 μC are placed at the four vertices of a square of sides 10.0 cm. What is the potential difference between the point at the intersection of the diagonals and the midpoint of one of the sides of the square?

55. **(a)** If 6.2×10^{-4} J of work are required to move a charge of 3.2 nC (one nanocoulomb = 10^{-9} coulombs) from point B to point A in an electric field, what is the potential difference between A and B?