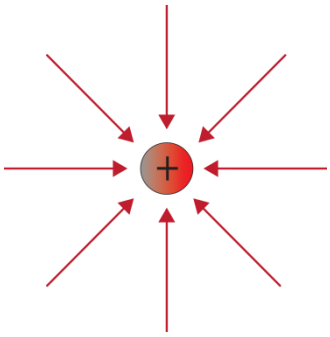
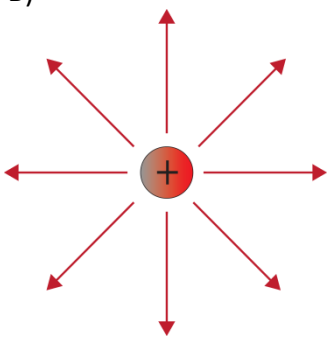
Electric Field, Potential Energy and Voltage
Multiple Choice Questions
PSI Physics Name_____

1. Which of the following represents the electric field map due to a single positive charge?

A)



B)



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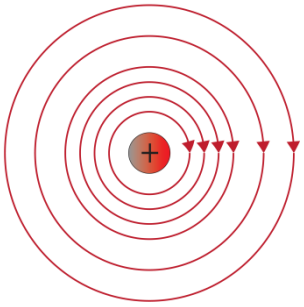
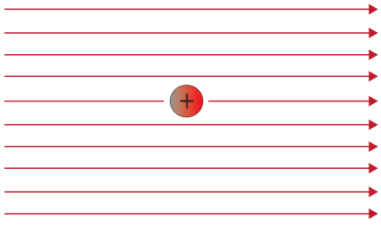
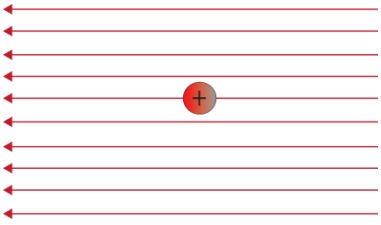


D)

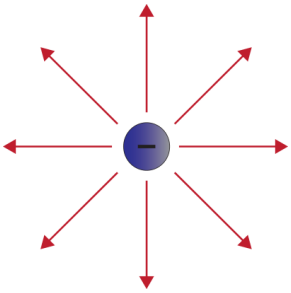


E)



2. Which of the following represents the electric field map due to a single negative charge?

A)



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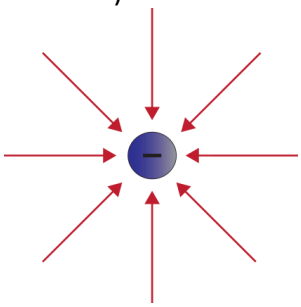
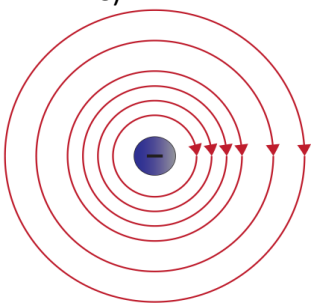
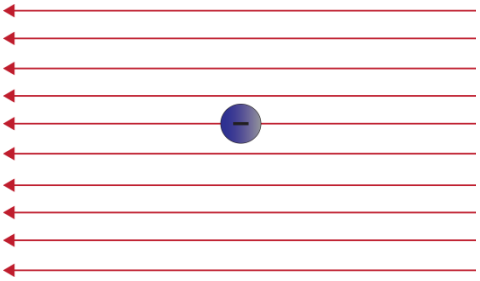


C)



D)



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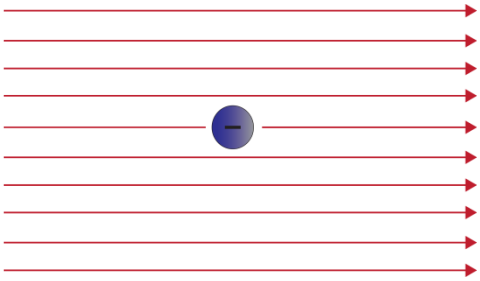
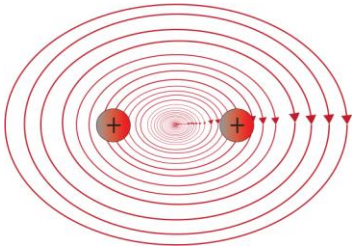


3. Which of the following represents the electric field map due to a combination of two positive charges?

A)



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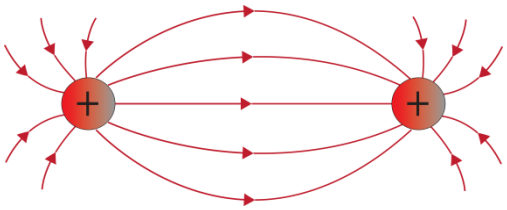
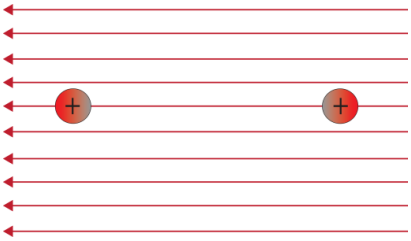
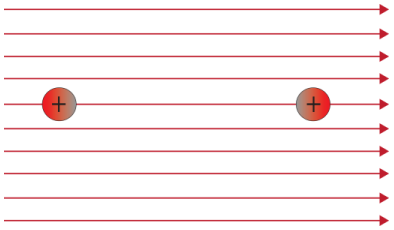


C)



D)



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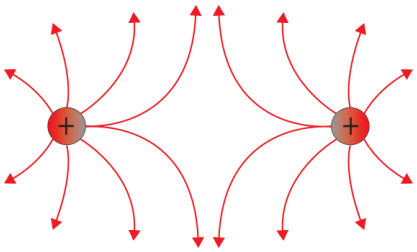
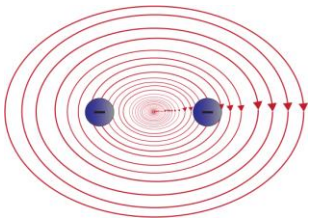
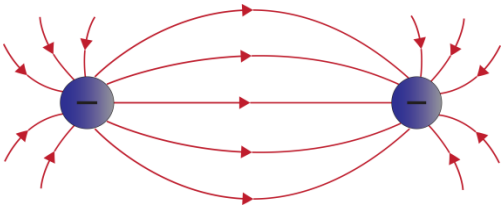


4. Which of the following represents the electric field map due to a combination of two negative charges?

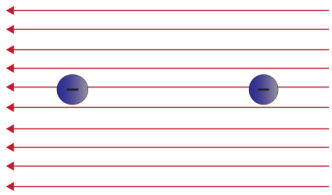
A)



B)



C)



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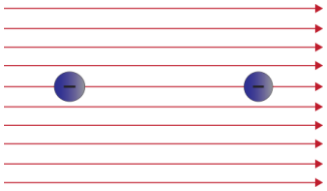

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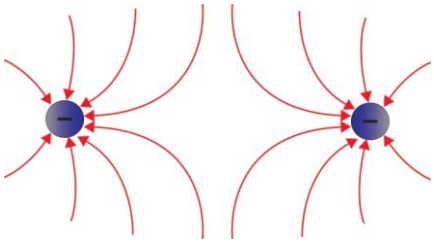
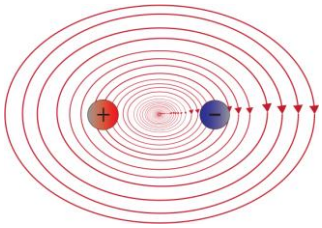
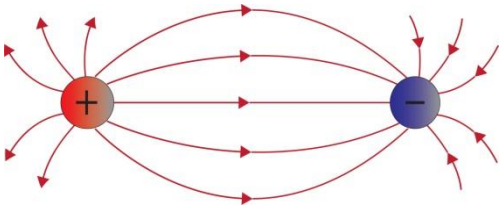
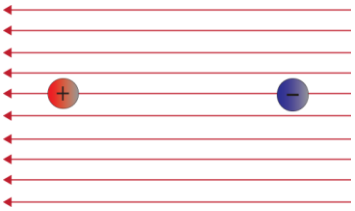
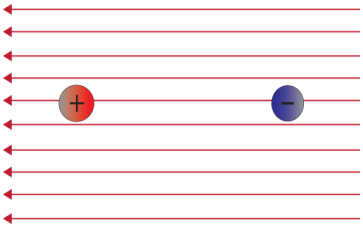


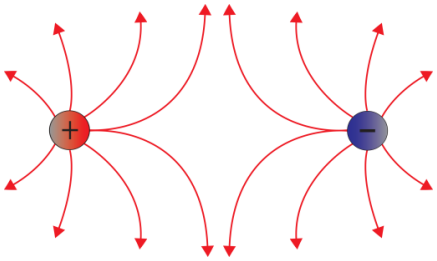
5. Which of the following represents the electric field map due to a combination of one positive and one negative charge?

A) 

B) 

C) 

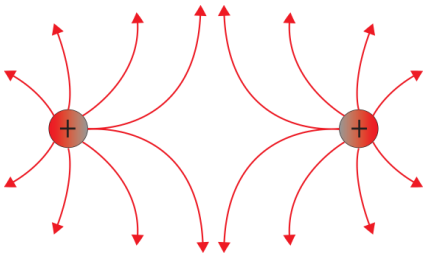
D) 

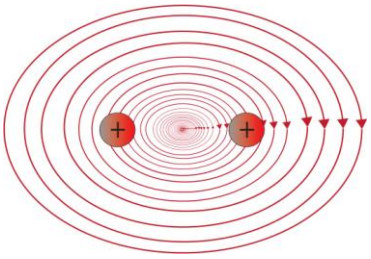
E) 

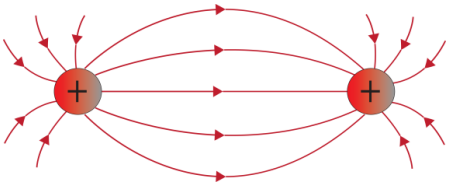
6. Compare the Gravitational Field and the Electric Field produced by a proton.
    A. The Gravitational Field is the same strength as the Electric Field.
    B. The Electric Field is stronger and is in the same direction as the Gravitational Field.
    C. The Electric Field is stronger and in the opposite direction of the Gravitational Field.
    D. The Gravitational Field is stronger and is in the same direction as the Electric Field.

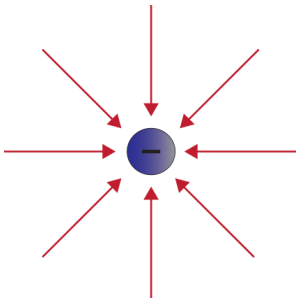
7. Which of the following is true inside a conducting sphere with a net positive charge that is insulated from the ground?
    A. The Electric Field and the Electric Potential are zero.
    B. The Electric Field is zero and the Electric Potential decreases the further away from the center.
    C. The Electric Field has a positive, non-zero value and the Electric Potential is equal to the Electric Potential at the surface.
    D. The Electric Field is zero, and the Electric Potential is equal to the Electric Potential at the surface.

8. Which of the following is a uniform electric field?

A. 

B. 

C. 

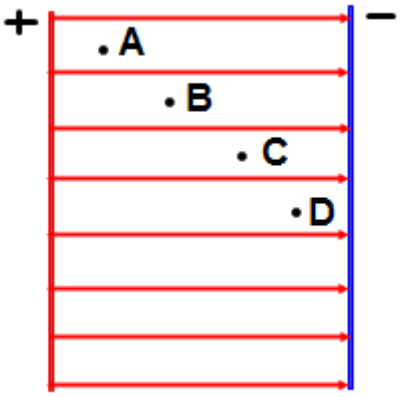
D. 

E. 

9. An electric field is created by two parallel plates. At which of the following points the electric field is the strongest?

A. A B. B C.C D.D

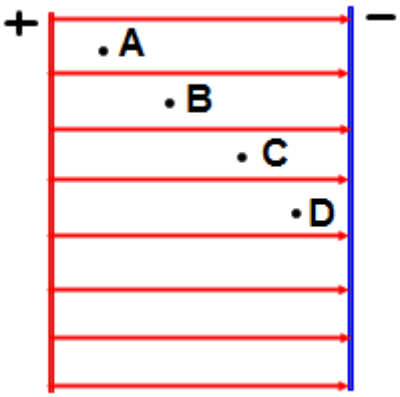
E. The electric field is the same at all points



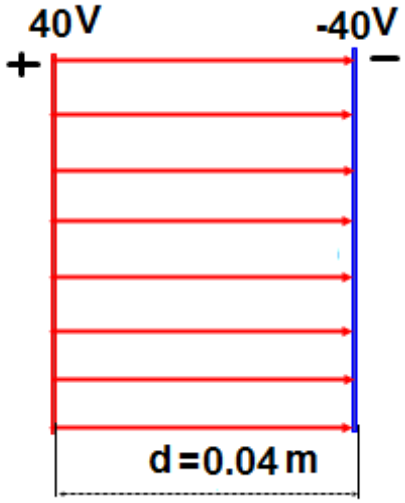
10. An electric field is created by two parallel plates. Which of the following points corresponds to the higher potential?

A. A B. B C.C D.D

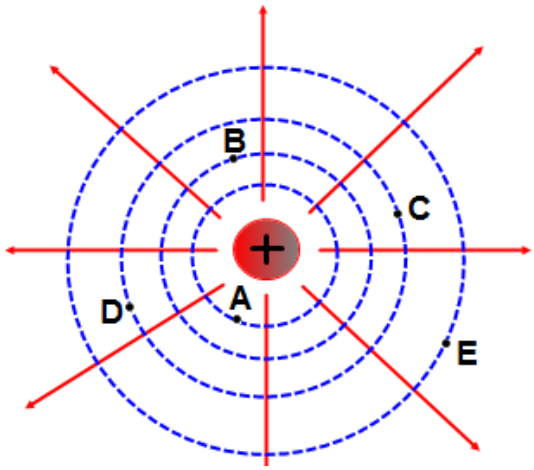
E. The electric field is the same at all points



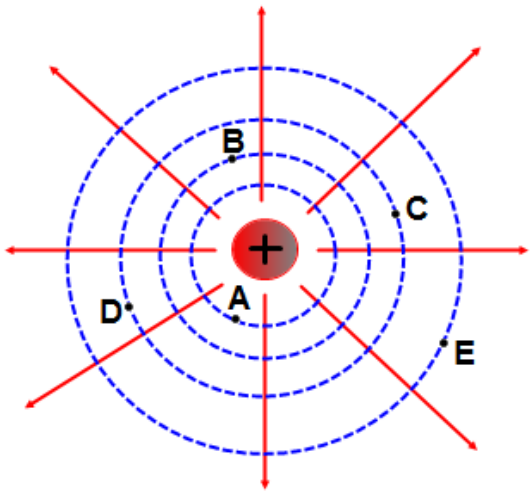
11. A uniform electric field is created by two parallel plates separated by a distance of 0.04 m. What is the magnitude of the electric field established between the plates?
    A. 20 V/m
    B. 200 V/m
    C. 2,000 V/m
    D. 20,000 V/m
    E. 0 V/m



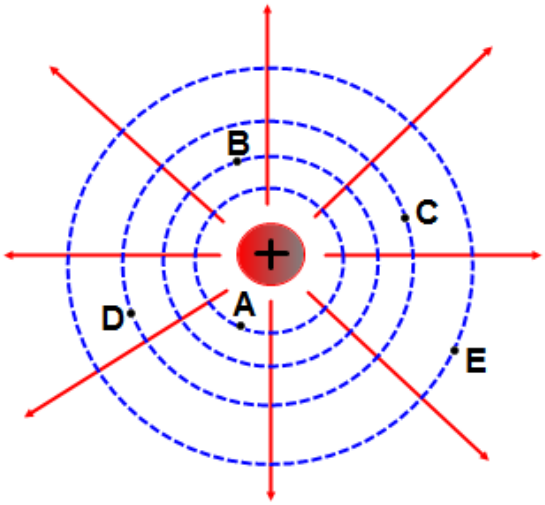
12. An electric field due to a positive charge is represented by the diagram. Which of the following points has higher potential?
    A. A
    B. B
    C. C
    D. D
    E. E

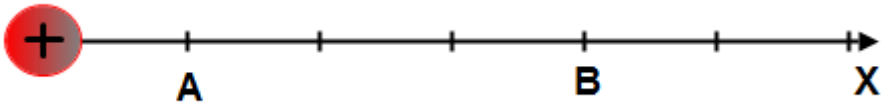


13. An electric field due to a positive charge is represented by the diagram. At which of the following points the electric field is strongest in magnitude?
    A. A
    B. B
    C. C
    D. D
    E. E

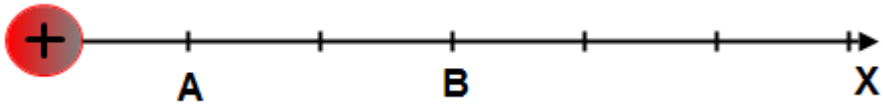


14. An electric field due to a positive charge is represented by the diagram. Between which of the following two points the electric field does zero work on a moving charge?
    A. A and B
    B. B and C
    C. C and D
    D. D and E
    E. E and A





15. In the above diagram, the electric potential at point A is V. What is the electric potential at point B in terms of V?
    A. 2 V B. 4 V C. V D. $\frac{1}{2}$ V E. $\frac{1}{4}$ V



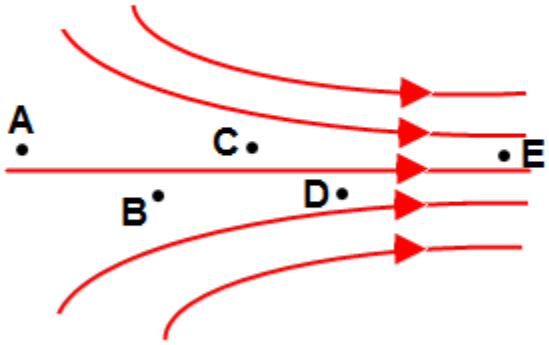
16. In the above diagram, the magnitude of the electric field at point A is E. What is the electric field at point B in terms of E?
    A. 3 E B. 9 E C. E D. $\frac{1}{9}$ E E. $\frac{1}{3}$ E

17. A conducting sphere is negatively charged. Which of the following statements is true?
    A. The charge is uniformly distributed throughout the entire volume
    B. The charge is located at the center of the sphere
    C. The charge is located at the bottom of the sphere because of gravity
    D. The charge is uniformly distributed on the surface of the sphere
    E. The negative charge is neutralized by the positive charge

18. A non-uniform electric field is represented by the diagram. At which of the following points the electric field is greatest in magnitude?

A. A B. B C.C

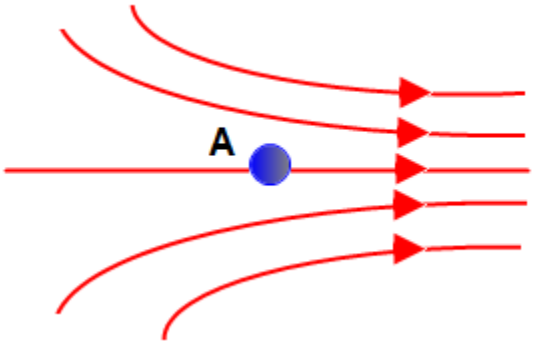
D.D E.E



19. A small conducting sphere is placed in a region of non-uniform electric field. What is the direction of the electric force on the sphere applied by the field?

A. B. C.

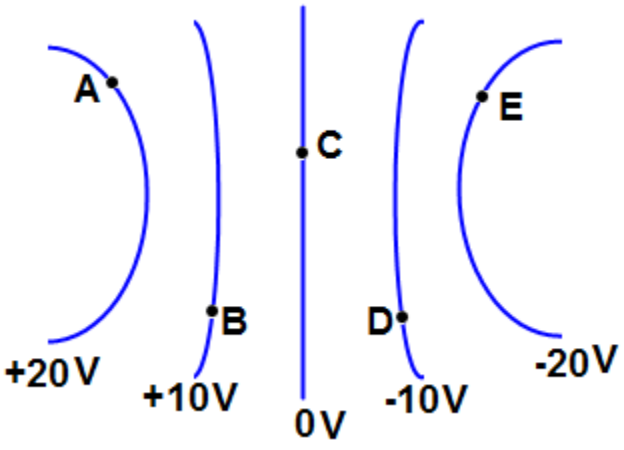
D. E.



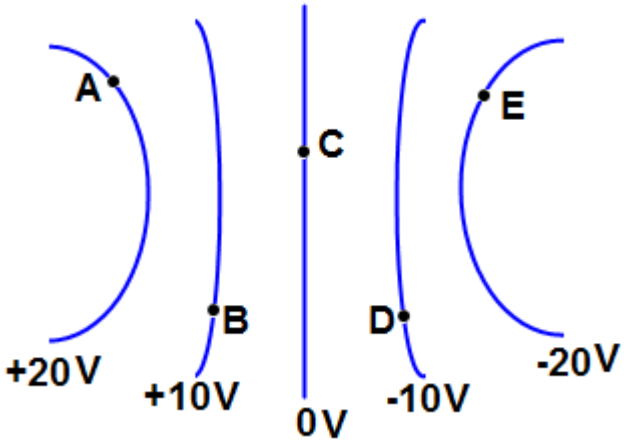
20. A non-uniform electric field is represented by equipotential lines. What is the direction of the electric field at point A?

A. B. C.

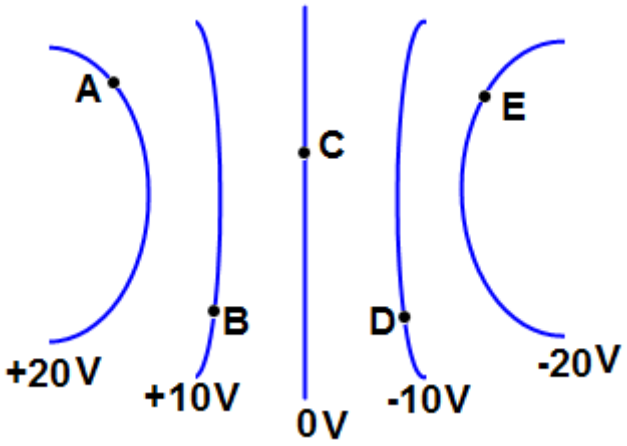
D. E.



21. A non-uniform electric field is represented by equipotential lines. How much work is done by the electric field when a positive charge of magnitude 1 μC moves from point A to point E?
A. 0 μJ B. 20 μJ C. 40 μJ D. 60 μJ
E. 80 μJ



22. A non-uniform electric field is represented by equipotential lines. A positive charge with a magnitude of 1 μC moves in the following path: A→B→C→D→E→A. How much work is done by the electric field?
A. 0 μJ B. 20 μJ C. 40 μJ D. 60 μJ
E. 80 μJ



Answers

1. B
2. B
3. E
4. E
5. B
6. C
7. D
8. E
9. E
10. A
11. C
12. A
13. A
14. C
15. E
16. D
17. D
18. E
19. A
20. E
21. C
22. A