AP Physics 1.23.20213

Name: _____

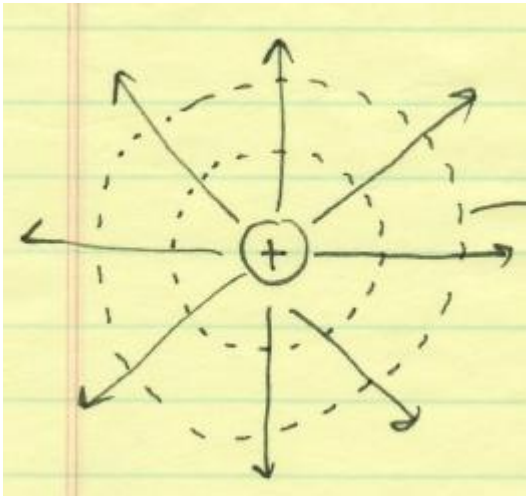
Class: _____

Date: _____

1. If the electric potential is zero at a given point then the electric field is zero there also.

   A. True

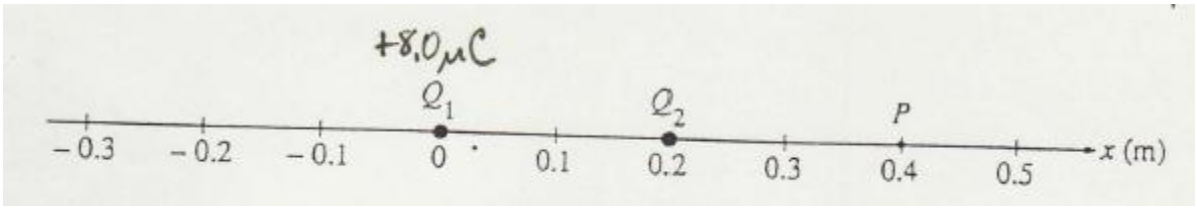
   B. False



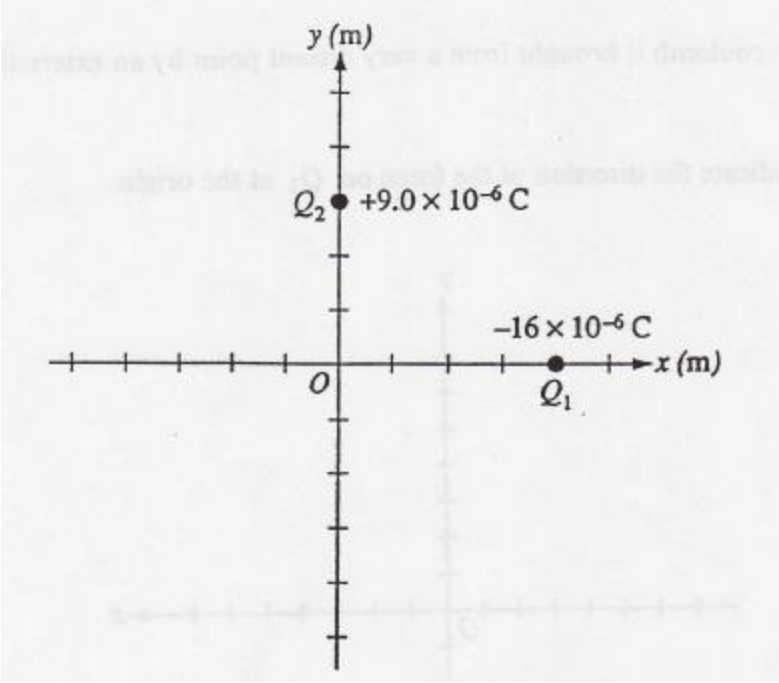
2. A student was looking through their notes after physics class and came to the drawing shown in the attached image. They'd forgotten to label the field shown with the dashed curves. Which of the following labels would be better:

   A. electric field

   B. potential field



3. Two point charges, Q1 and Q2 are located at distance of 0.20 m apart as shown in the attached image. The net electric field is zero at point P, located 0.40 m from Q1 and 0.20 m from Q2. Determine the magnitude in microcoulombs of the charge Q2.

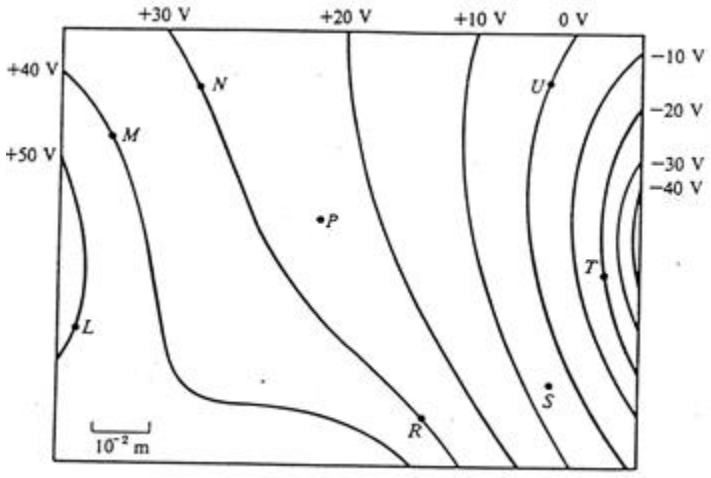


4. Calculate the magnitude of the electric field at the origin, in N/C

5. Since the electric potential strength can take on positive values, negative values, and also have a value of zero, clearly it is possible for equipotential lines to cross.

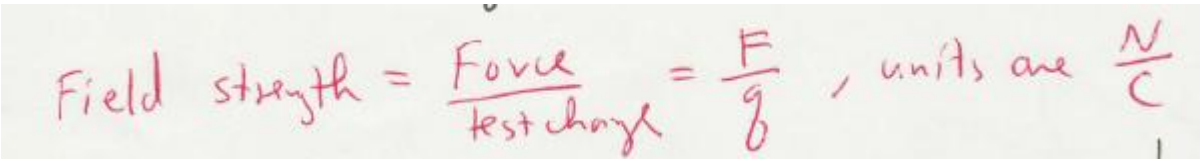
A. True

B. False



6. Which of the following intervals gives the range within which the electric field strength, E, at point R (see the attached image) would lie, if the field strength is given in V/m.

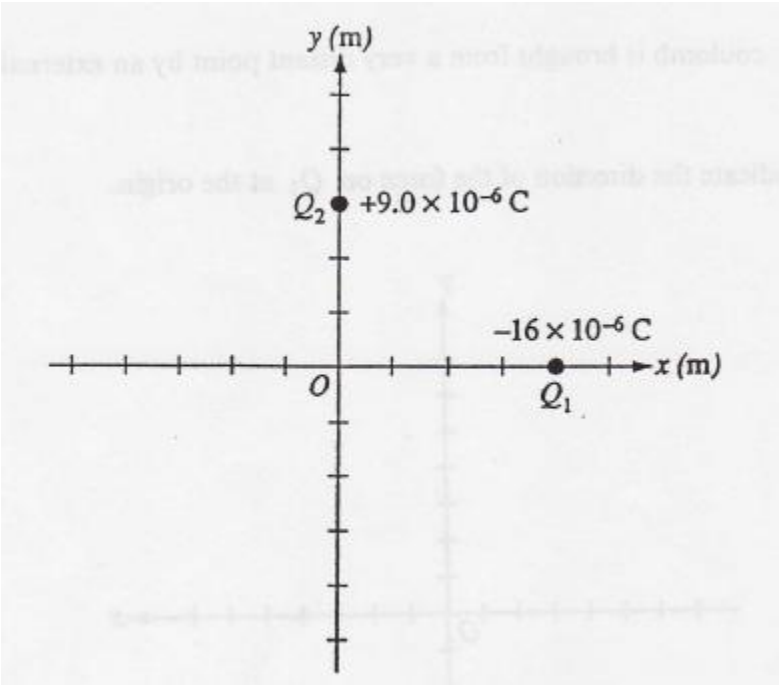
A. 0<E<300
B. 300<E<600
C. 600<E<900
D. 900<E<1200
E. 1200<E<1500
F. 1500<E<1800
G. 1800<E<2100
H. 2100<E<2400
I. 2400<E<2700
J. 2700<E<3000



7. Give the value of the potential difference between points L and T as shown on the attached image

8. A student was going through their notes after physics class and found the sentence shown in the attached image. They'd forgotten to label what type of field the note referred to. Which of the following labels would be better.

A. electric field
B. potential field



9. Consider the charges Q1 and Q2 shown on the attached image, these charges are fixed in position and cannot move. Suppose a third charge, Q3= -8 microcoulombs, is brought from far away by an external force and placed at the origin. Which of the following gives the direction of the net force felt by Q3 and a result of charges Q1 and Q2:

A. 

B. 

C. 

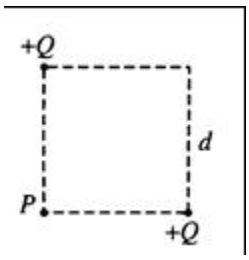
D. 

E. 

F. 

G. 

H. 



10. The figure shows two particles, each with a charge of +Q, that are located at the opposite corners of a square of side length d. What is the direction of the net electric field at point P?

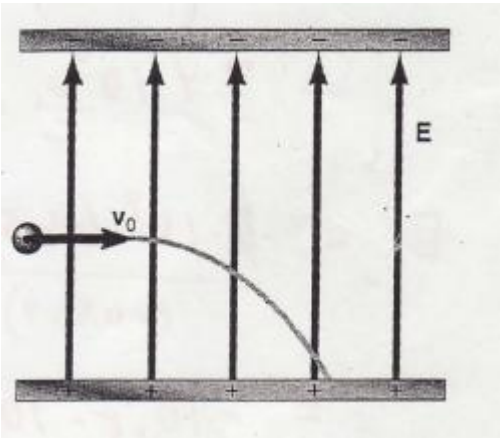
A. 

B. 

C. 

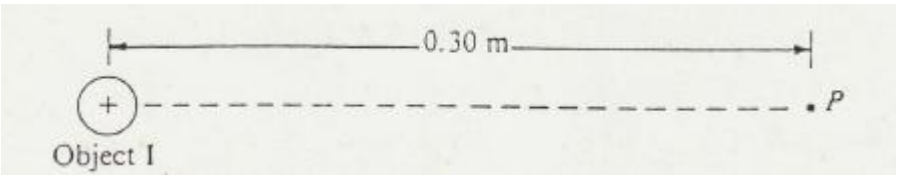
D. 

E. 

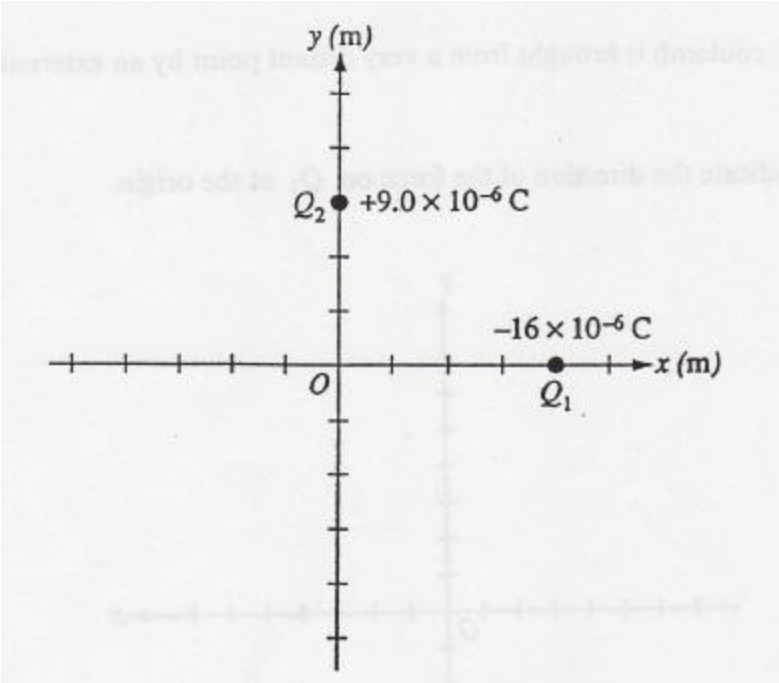


11. In class we worked a warm up problem with an electron traveling through vacuum entering a parallel plate capacitor and curving as shown on the attached image. Suppose we changed the problem a bit and, keeping the capacitor conditions, distances and charges just as they originally were, we shot a proton into the capacitor instead of an electron. Recall that the charges on an electron and a proton are equal in magnitude and opposite in sign. Which of the following best describes the behavior of the proton under these conditions. The proton path:

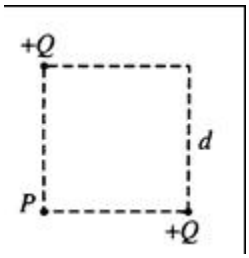
A. curves down more steeply than the electron.
B. curves down the same as the electron
C. curves down less steeply than the electron
D. curves up more steeply than the electron curves down
E. curves up the same as the electron curves down
F. curves up less steeply than the electron curves down



12. Object I shown in the attached image has a charge of 0.006 microcoulombs and a mass of 0.0025 kg. Calculate the electric potential in volts at point P.



13. Calculate the magnitude of the potential field at the origin, in volts



14. The figure shows two particles, each with a charge of +Q, that are located at the opposite corners of a square with side length d. What is the potential energy of a particle of charge +q that is held at point P?

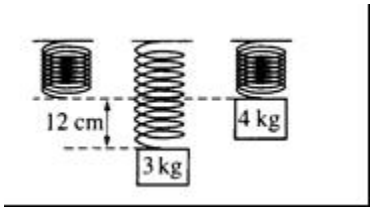
A. Zero

B. $\frac{\sqrt{2}}{4\pi\varepsilon_0}\frac{qQ}{d}$

C. $\frac{1}{4\pi\varepsilon_0}\frac{qQ}{d}$

D. $\frac{2}{4\pi\varepsilon_0}\frac{qQ}{d}$

E. $\frac{2\sqrt{2}}{4\pi\varepsilon_0}\frac{qQ}{d}$



15. A block of mass 3.0 kg is hung from a spring as shown, causing it to stretch 12 cm at equilibrium. The 3.0 kg block is then replace by a 4.0 kg block, and the new block is released from the position shown above, at which the spring is unstretched. How far will the 4.0 kg block fall before its direction is reversed?

A. 9 cm

B. 18 cm

C. 24 cm

D. 32 cm

E. 48 cm

16. Which of these founding fathers was apparently the first to use "+" and "-" to denote the two types of electric charge.

A. Samuel Adams
B. Patrick Henry
C. Abigail Adams
D. Thomas Jefferson
E. George Washington
F. James Madison
G. Aaron Burr
H. Alexander Hamilton
I. Benjamin Franklin
J. Paul Revere