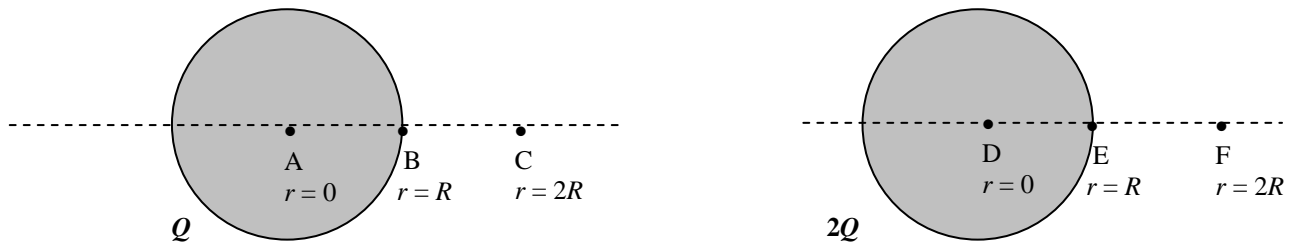


### Gauss's Law: Spherical Clouds of Charge—Electric Field

Shown below are two clouds of charge, each of the same radius,  $R$ . The charge is uniformly distributed throughout each of the clouds. One cloud has a total charge  $Q$ , and the other has a total charge  $2Q$ .

Rank the labeled points from greatest to least in terms of the electric field magnitude at that location.



Greatest 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ Least

Or, the electric field is the same at all points. \_\_\_\_\_

Please carefully explain your reasoning.

How sure are you of your ranking?

Basically Guessed

1

2

3

4

5

6

7

8

9

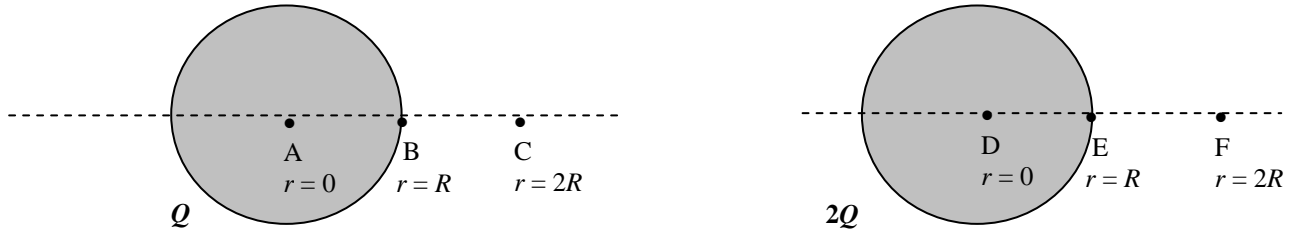
10

Very Sure

## Gauss's Law: Spherical Clouds of Charge—Electric Potential

Shown below are two clouds of charge, each of the same radius,  $R$ . The charge is uniformly distributed throughout each of the clouds. One cloud has a total charge  $Q$ , and the other has a total charge  $2Q$ .

Rank the labeled points from greatest to least in terms of the electric potential at that location.



Greatest 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ Least

Or, the electric potential is the same at all points. \_\_\_\_\_

Please carefully explain your reasoning.

How sure are you of your ranking?

Basically Guessed

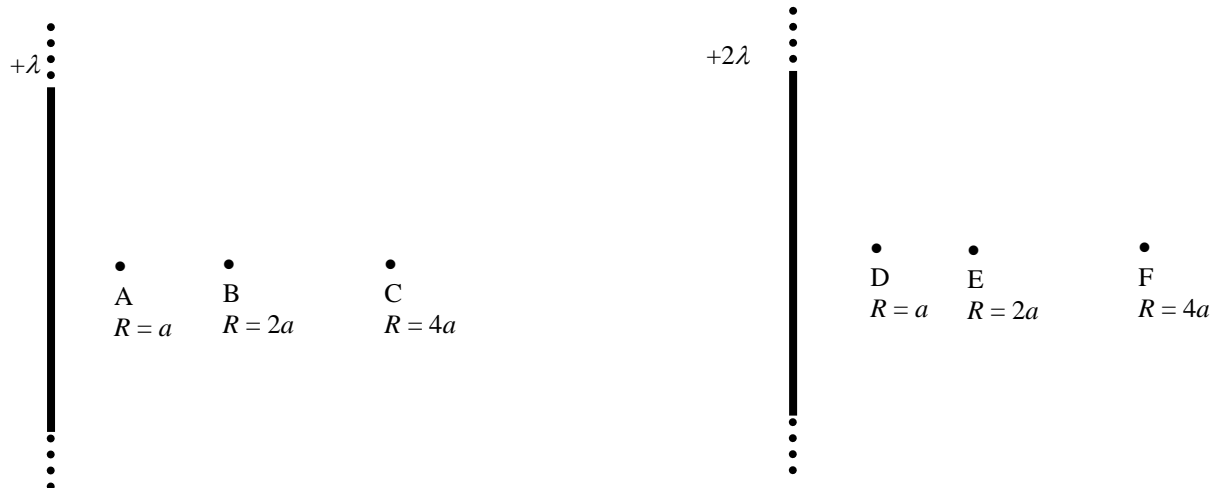
1            2            3            4            5            6            7            8            9            10

Very Sure

## Gauss's Law: Infinite Lines of Charge—Electric Field

Shown below are two infinite lines of charge, one of density  $+\lambda$  and the other of density  $+2\lambda$ .

Rank the labeled points from greatest to least on the basis of the magnitude of the electric field at each of the points.



Greatest 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ Least

Or, all the points have the same magnitude electric field. \_\_\_\_\_

Please carefully explain your reasoning.

How sure are you of your ranking?

Basically Guessed

1

2

3

4

5

6

7

8

9

10

Very Sure