# ECE 09.303
# Quiz 2 – Week of 10/8/2018 - Solutions

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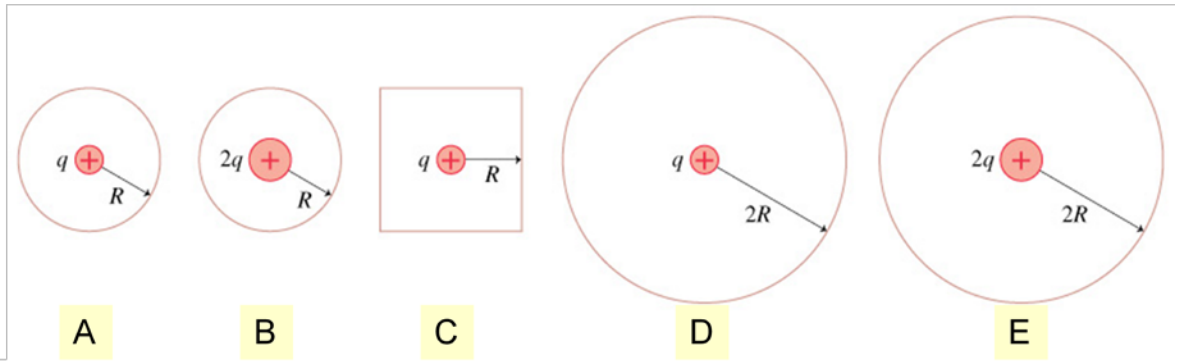
**Name:** _____

1) (5 Points)




These are two-dimensional cross sections through three dimensional closed spheres and a cube.

Which of them has the largest flux through surfaces A to E?

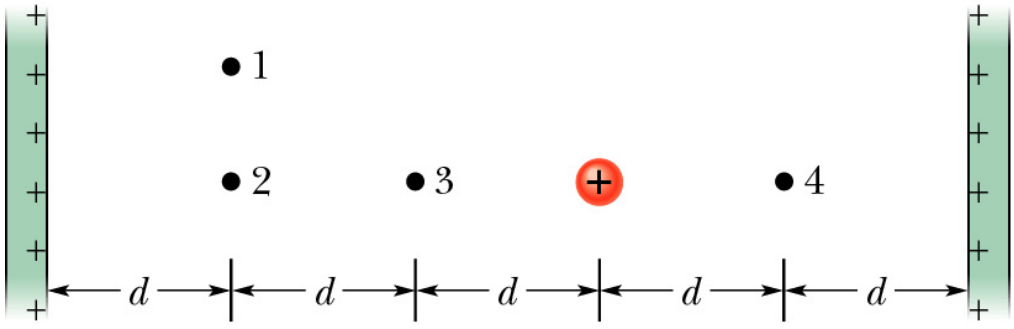
Which has the smallest flux?

Answers: $\Phi_B = \Phi_E > \Phi_A = \Phi_C = \Phi_D$

The flux through a CLOSED surface depends only on the amount of enclosed charge, not the size or shape of the surface.

2) (5 Points)

The figure shows two large non-conducting sheets with identical positive volume charge density. Rank the four labeled points according to the magnitude of the net electric field there, greatest first.



Answer:

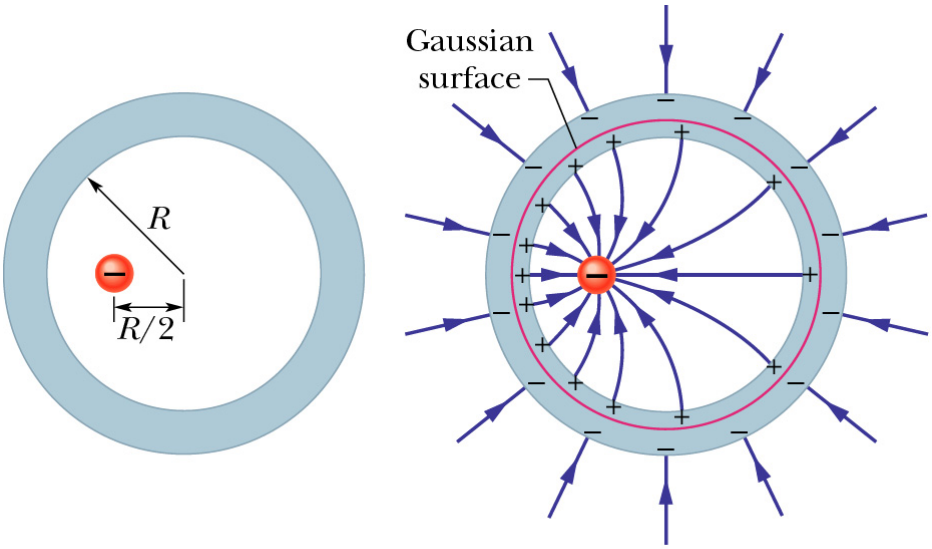
C, D equal

B

A

3) (5 Points)

Fig. below shows a cross section of a spherical metal shell of inner radius R. A point charge of –5.0 μC is located at a distance R/2 from the centre of the shell. If the shell is electrically neutral, what are the (induced) charges on its inner and outer surfaces? Are those charges uniformly distributed? What is the field pattern inside and outside the shell?




4) (5 Points)

A ball of charge –50e lies at the centre of a hollow spherical metal shell that has a net charge of –150e.

a. What is the charge on the shell's inner surface?
b. What is the charge on the shell's outer surface?

Answers: (a) +50e

(b) -200e