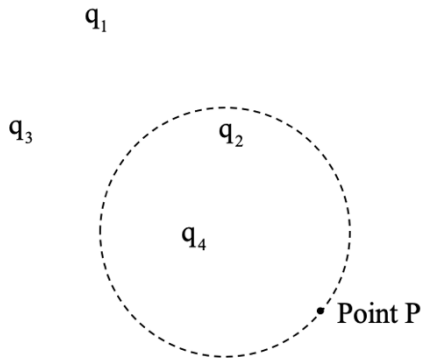
Note: This question came from (or was inspired by) the "Frensley Physics" YouTube site:

Four charges lie in the plane of the page. The cross-section of a spherical Gaussian circle is shown by the dotted line. On that line is (which is to say, on that surface) is a single Point P.



a.) Which of the charges contributes to the electric field at Point P? Justify your response.

--all of the charges will contribute to the electric field at Point P;
--any charge in the region will have a Coulomb-like effect;

b.) Which of the charges contributes to the electric flux through the surface? Justify your response.

--according to Gauss's Law, the electric flux will be proportional to the charge enclosed by the Gaussian surface (the sphere), so q2 and q4 will answer the question.

c.) If the radius of the sphere were made slightly larger, must that increase the net electric flux through the sphere? Justify your response.

--the surface area of the sphere would increase, but the density of electric field lines through the surface would decrease so the flux would remain the same;
--OR, the net charge inside the Gaussian surface would not have changed, so the net flux would not have changed.

d.) If the radius of the sphere were made much bigger, must that increase the net electric flux through the sphere? Justify your response.

--again, if the sphere were made big enough, additional charges might be included and that would change the electric flux;
--the change wouldn't necessarily increase—if the additional charges happen to be opposite q2 and q4, then the net charge inside the Gaussian surface would go down and so would the net electric flux.