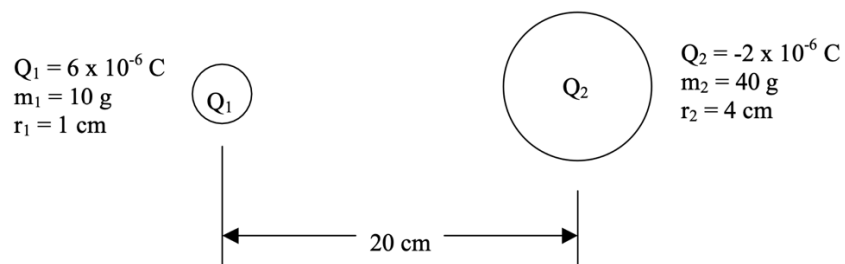1. Two point charges, Q_A = +8 µC and Q_B = -5 µC, are separated by a distance r = 10 cm. What is the magnitude of the electric force. The constant k = 8.988 x 10^9 Nm^2C^{-2} = 9 x 10^9 Nm^2C^{-2}.

2. Two small plastic balls are separated by 20 cm. Their charge, mass, and radii are also given. If both balls are free to move,
   a. Which ball experiences a larger force? Explain.
   b. When the balls collide, which will be moving faster? Explain.
   c. Find the force (mag. and dir.) on each ball.
   d. Find the acceleration (mag. and dir.) of each ball.

$Q_1 = 6$ x 10^{-6} C
$m_1 = 10$ g
$r_1 = 1$ cm

Q_1

Q_2

$Q_2 = -2$ x 10^{-6} C
$m_2 = 40$ g
$r_2 = 4$ cm

20 cm

3. Two charges $Q_A = Q_B = +Q$ are held fixed on the y-axis at (0, 3d) and (0,-3d). A third charge, $Q_C = +Q$, is released from rest on the x-axis at (4d, 0).

    a. Which way will Q_C move? Explain.

    b. Describe the motion of Q_C. Does it speed up? Slow down? Turn around? Where is it fastest? Etc.

    c. Find the force (mag. and dir.) on Q_C.

    d. Repeat a) – c) for the case where $Q_C = -2Q$.