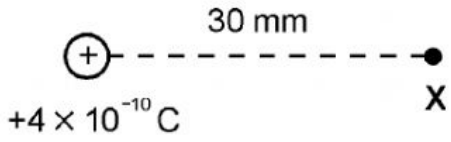
Electrostatics 3

Complete the exercises in your book and upload pictures to the assignment in Teams.

Question 7

A small point charge carries a charge of $+4 \times 10^{-10}$ C.



7.1 Calculate the magnitude of the electric field strength at a distance of 30 mm from the point charge.

7.2 A second point charge of -8×10^{-10} C is placed at position X. Calculate the magnitude of the force between the charges.

QUESTION 8

Consider a positive point charge of $+5 \times 10^{-9}$ C.

8.1 Draw a neat sketch of the electric field pattern around this point charge.

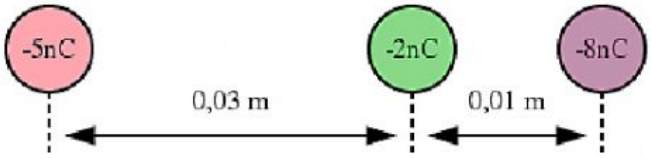
8.2 Calculate the magnitude and direction of the force exerted on a negatively charged particle of -3×10^{-9} C placed 0,5 m from the point charge of $+5 \times 10^{-9}$ C.

8.3 The negative charge moves toward the positive charge. Explain how the force experienced by each charge will change. (Only use the words DECREASE, REMAIN THE SAME or INCREASE as an answer.)

8.4 The two charges come into contact and then separate again. Calculate the charge on each after they have separated.

Question 11

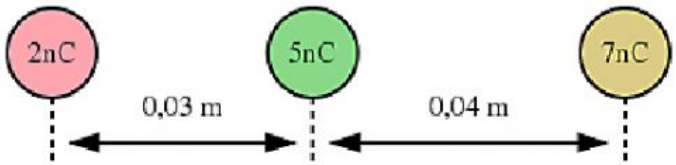
11. Three point charges are in a straight line. Their charges are Q1 = -2×10^{-9} C, Q2 = -5×10^{-9} C and Q3 = -8×10^{-9} C. The distance between Q1 and Q2 is 0,03 m and the distance between Q2 and Q3 is 0,01 m.



What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

12.

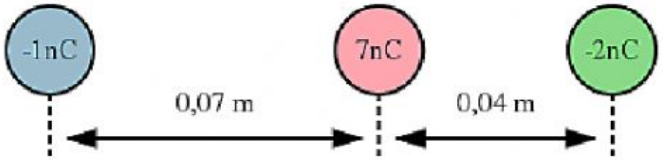
Three point charges are in a straight line. Their charges are Q1 = 5×10^{-9} C, Q2 = 2×10^{-9} C and Q3 = 7×10^{-9} C. The distance between Q1 and Q2 is 0,03 m and the distance between Q2 and Q3 is 0,04 m.



What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

13.

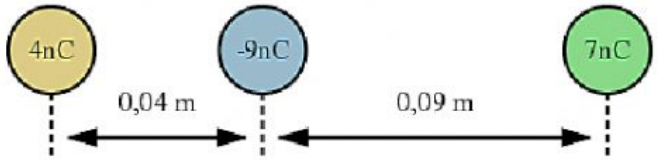
Three point charges are in a straight line. Their charges are Q1 = 7×10^{-9} C, Q2 = -1×10^{-9} C and Q3 = -2×10^{-9} C. The distance between Q1 and Q2 is 0,07 m and the distance between Q2 and Q3 is 0,04 m.



What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

14.

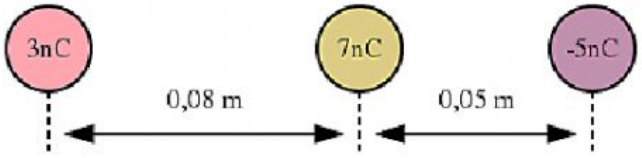
Three point charges are in a straight line. Their charges are Q1 = -9×10^{-9} C, Q2 = 4×10^{-9} C and Q3 = 7×10^{-9} C. The distance between Q1 and Q2 is 0,04 m and the distance between Q2 and Q3 is 0,09 m.



What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

15.

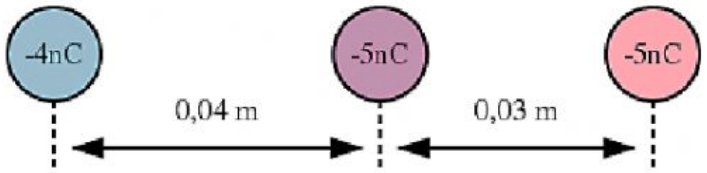
Three point charges are in a straight line. Their charges are Q1 = 7×10^{-9} C, Q2 = 3×10^{-9} C and Q3 = -5×10^{-9} C. The distance between Q1 and Q2 is 0,08 m and the distance between Q2 and Q3 is 0,05 m.



What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

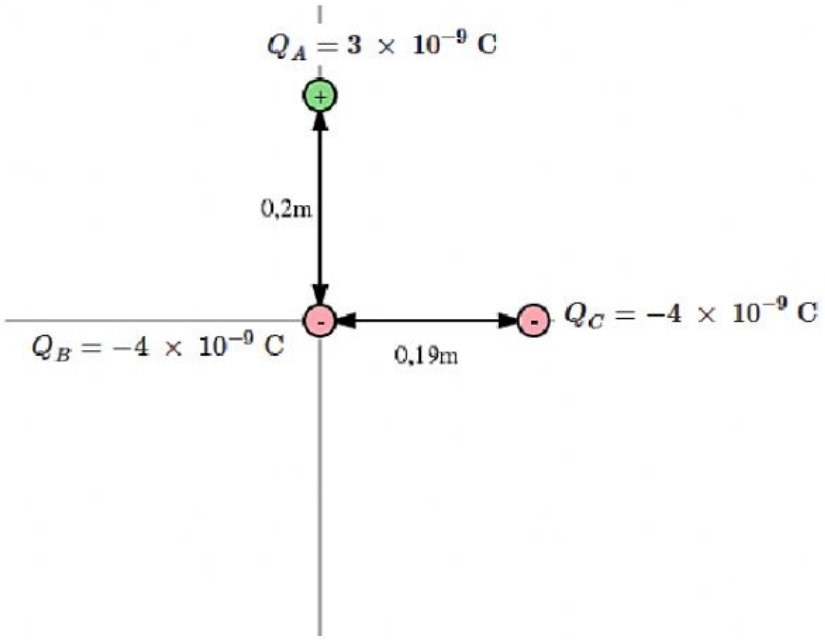
16.

Three point charges are in a straight line. Their charges are Q1 = -5×10^{-9} C, Q2 = -4×10^{-9} C and Q3 = -5×10^{-9} C. The distance between Q1 and Q2 is 0,04 m and the distance between Q2 and Q3 is 0,03 m.



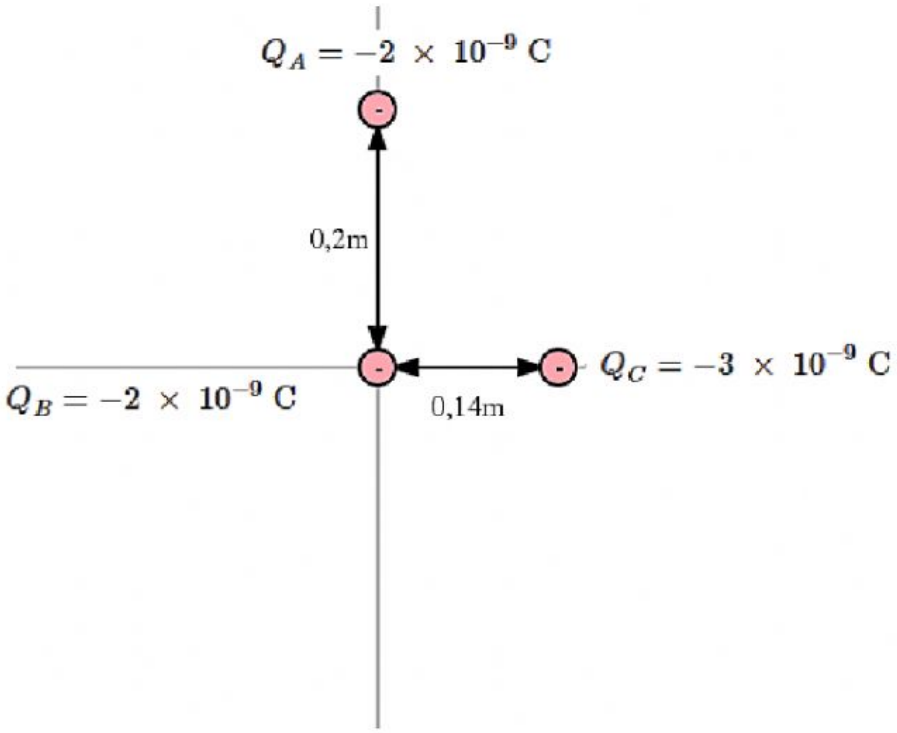
What is the net electrostatic force on Q2 from the other two charges? Write your answer in scientific notation, rounding to two digits after the decimal point.

17.



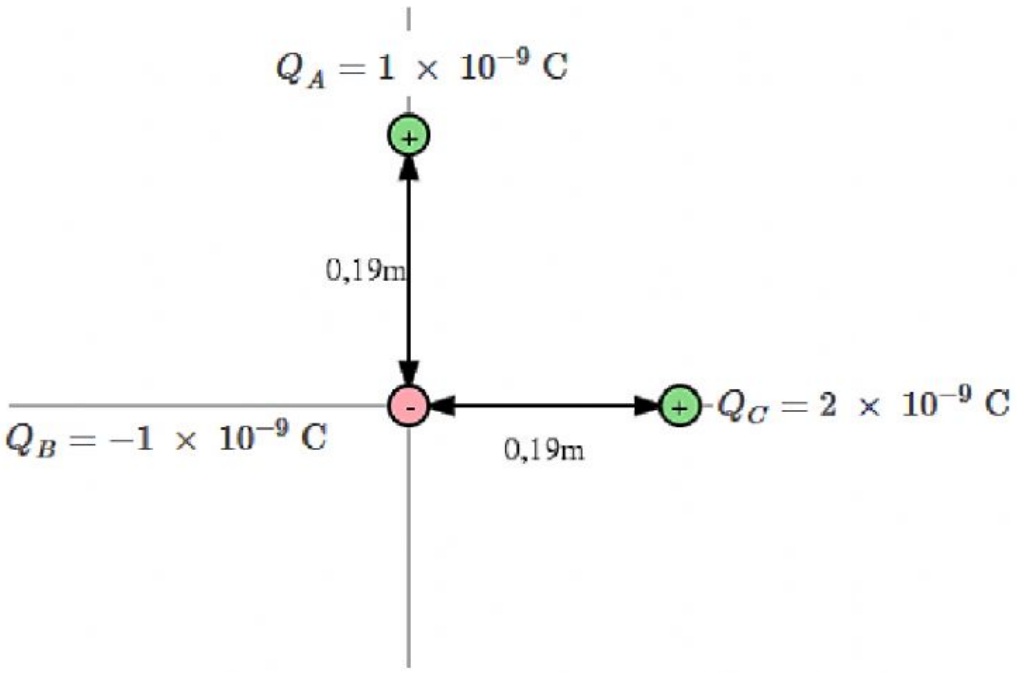
Calculate the magnitude and bearing (relative to the positive x-axis) of the resultant force acting on Q_B.

18.



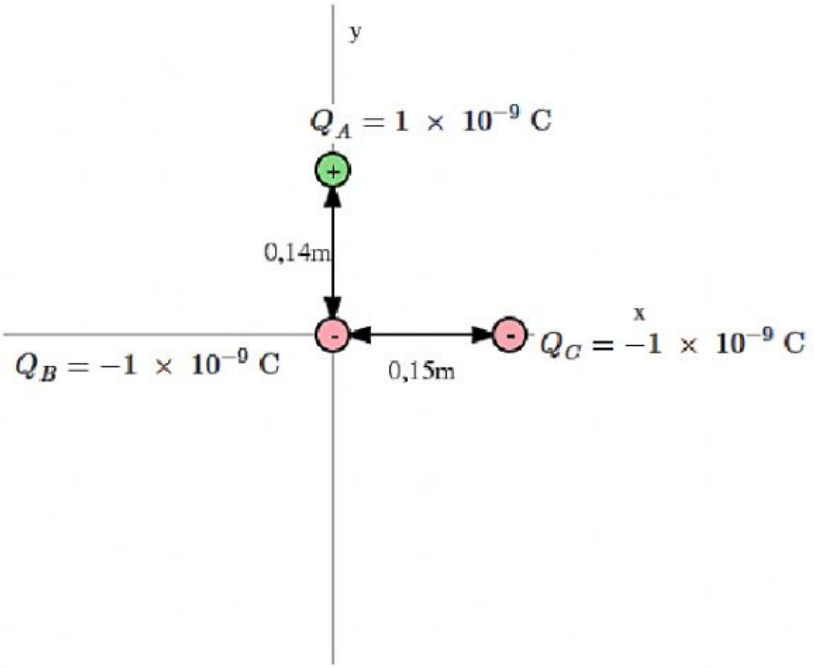
Calculate the magnitude and bearing (relative to the positive x-axis) of the resultant force acting on Q_B.

19.



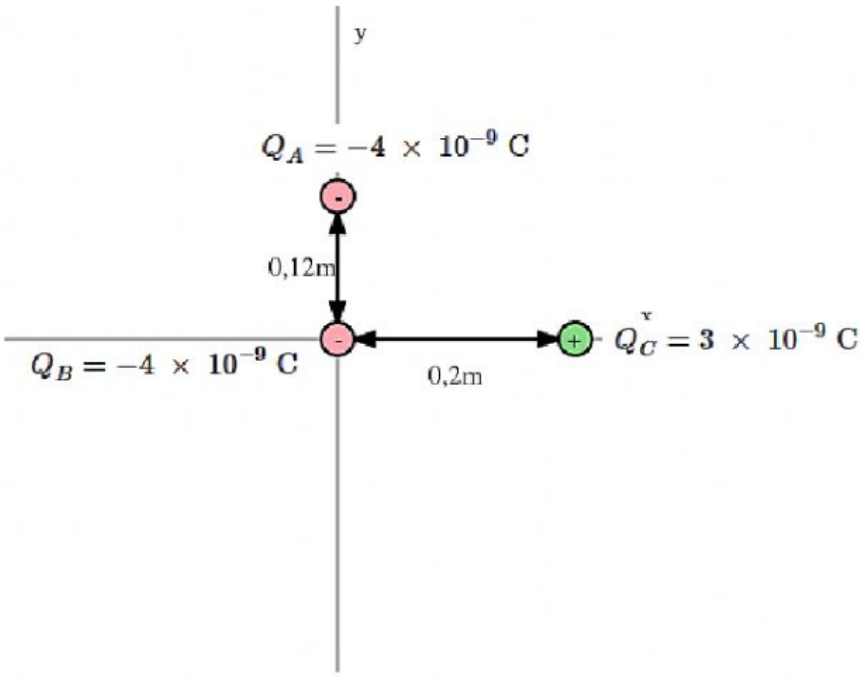
Calculate the magnitude and bearing (relative to the positive x-axis) of the resultant force acting on Q_B.

20.



Calculate the magnitude and bearing (relative to the positive x-axis) of the resultant force acting on Q_B.

21.



Calculate the magnitude and bearing (relative to the positive x-axis) of the resultant force acting on Q_B.

27.

Calculate the charge on two identical spheres that are similarly charged if they are separated by 28 cm and the electrostatic force between them is 0,012 N.

All my answers have been submitted on MS Teams!