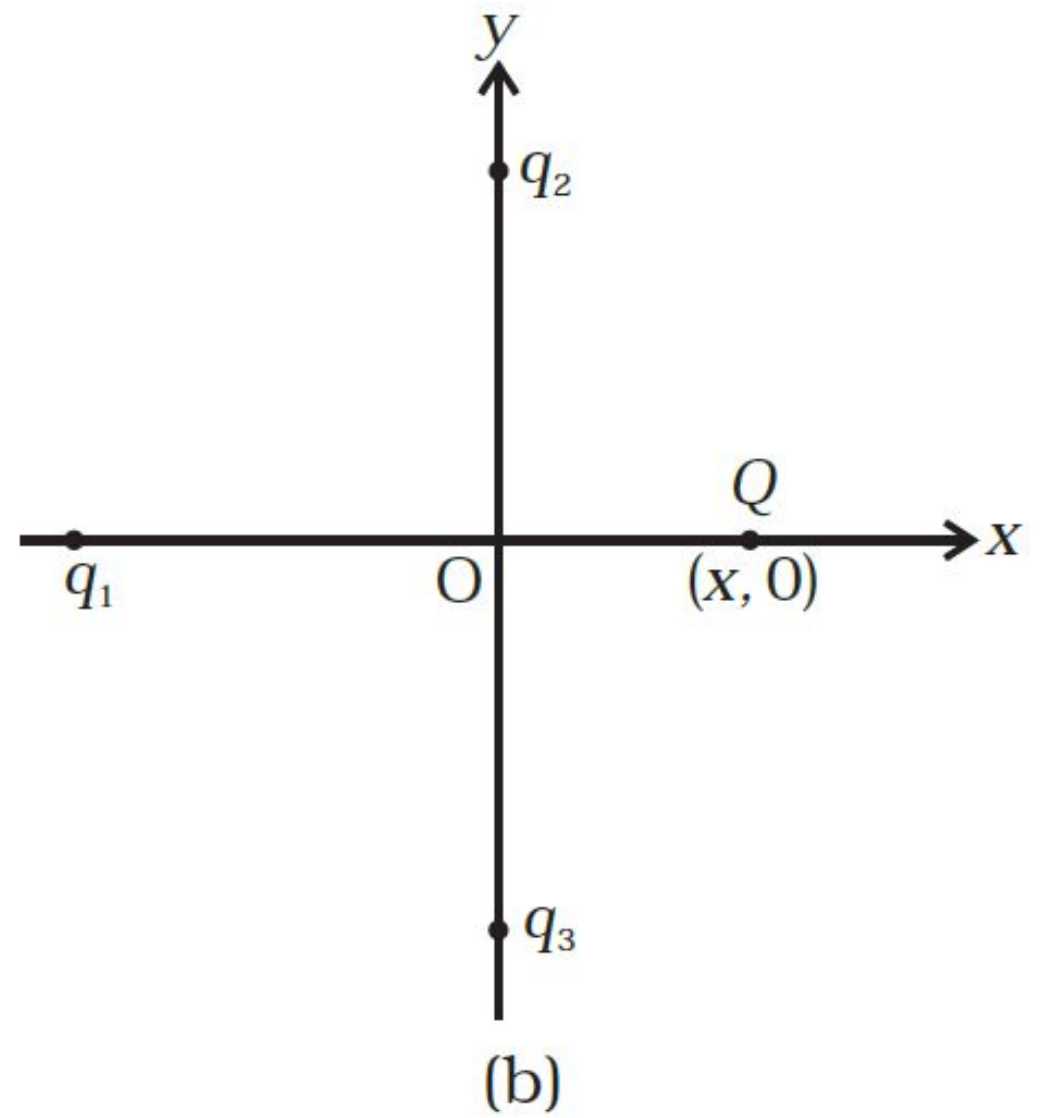
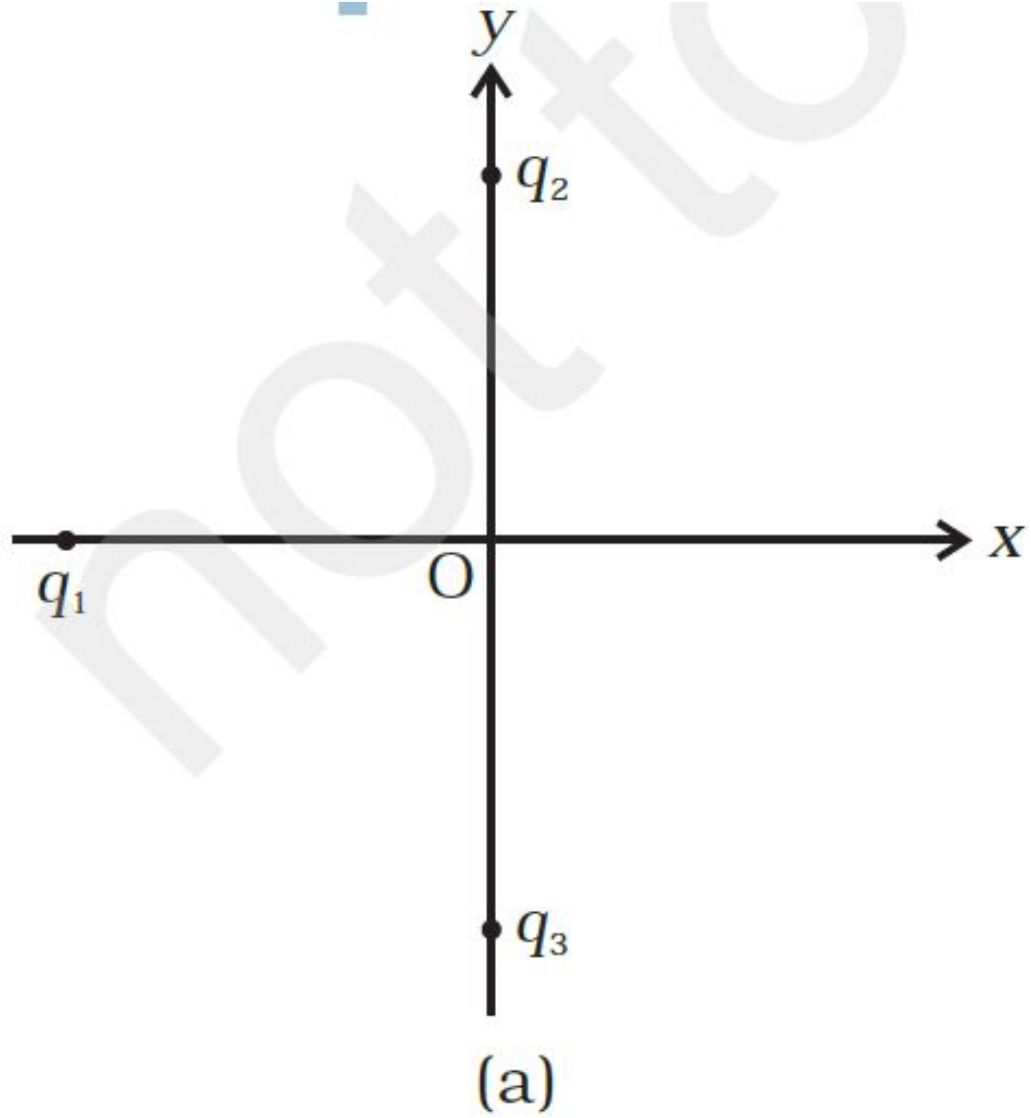


Unit 1

Problem Solving

**In
Electrostatics**

In the figure, two positive charges q_1 and q_3 fixed along the y -axis, exert a net electric force in the (+ve) x -direction on a charge q_1 fixed along the x axis.



If a positive charge Q is added at $(x, 0)$, the force on q_1

- (a) shall increase along the positive x -axis.
- (b) shall decrease along the positive x -axis.
- (c) shall point along the negative x -axis.
- (d) shall increase but the direction changes because of the intersection of Q with q_2 and q_3 .

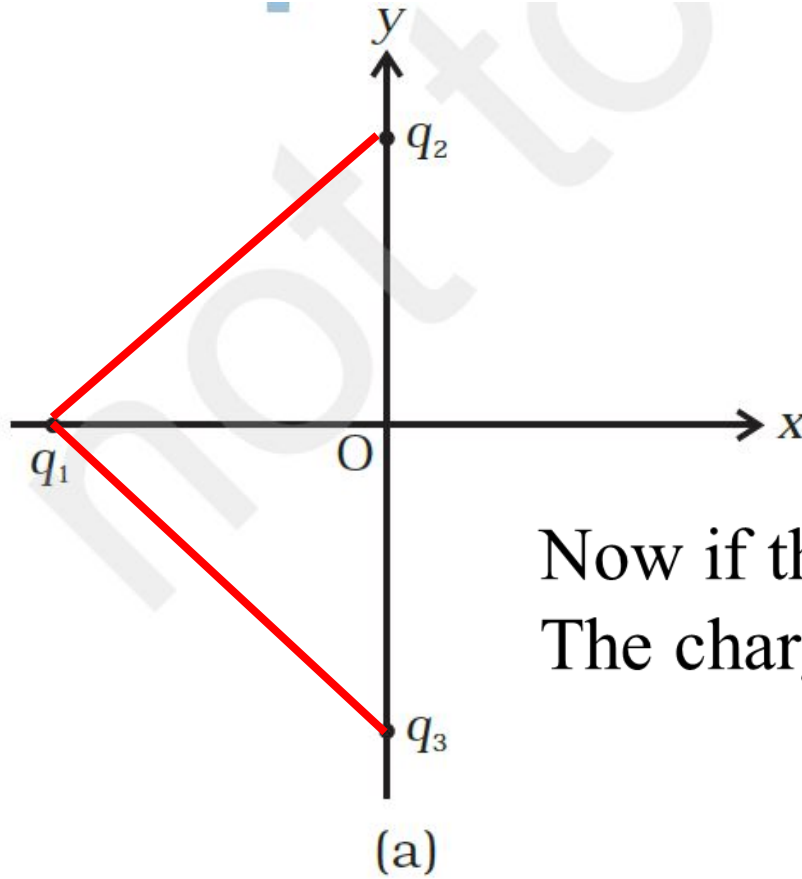
How to understand this problem ?

- Draw the fig your self
- Mark the charges q_2 and q_3
- Both are positive so mark +
- Mark location of charge q_1
- Figure out the nature of force charge on q_1 , so that a net electrostatic force is towards + x direction

Remember Properties of charges

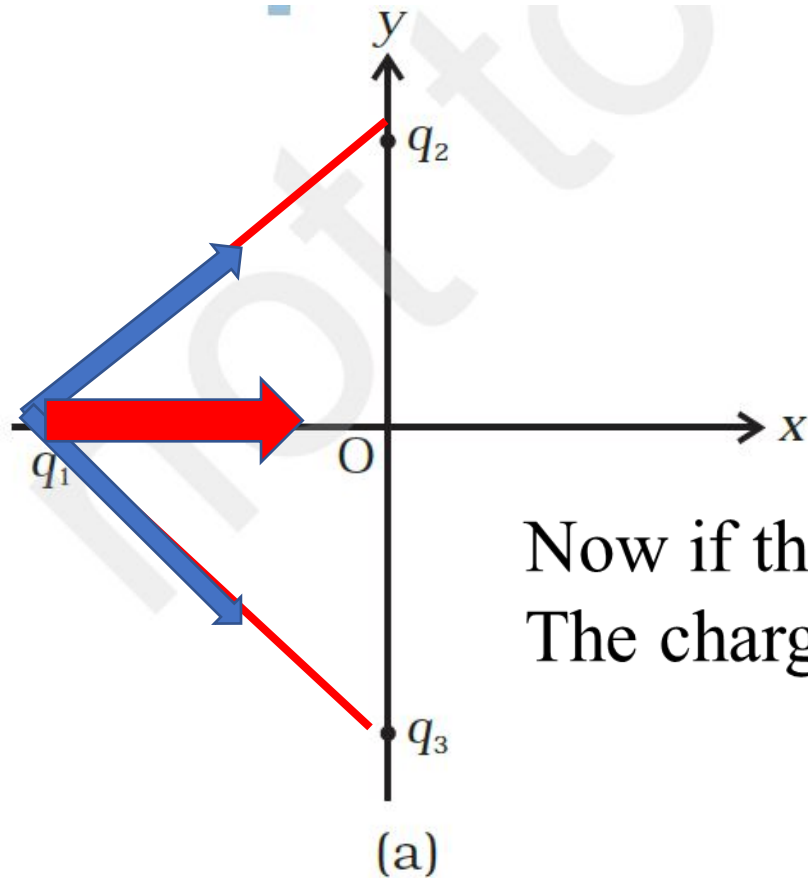
- Like charges repel and unlike charges attract
- Electrostatic forces can only be added vectorially

Draw lines to join q_2 and q_3 to q_1



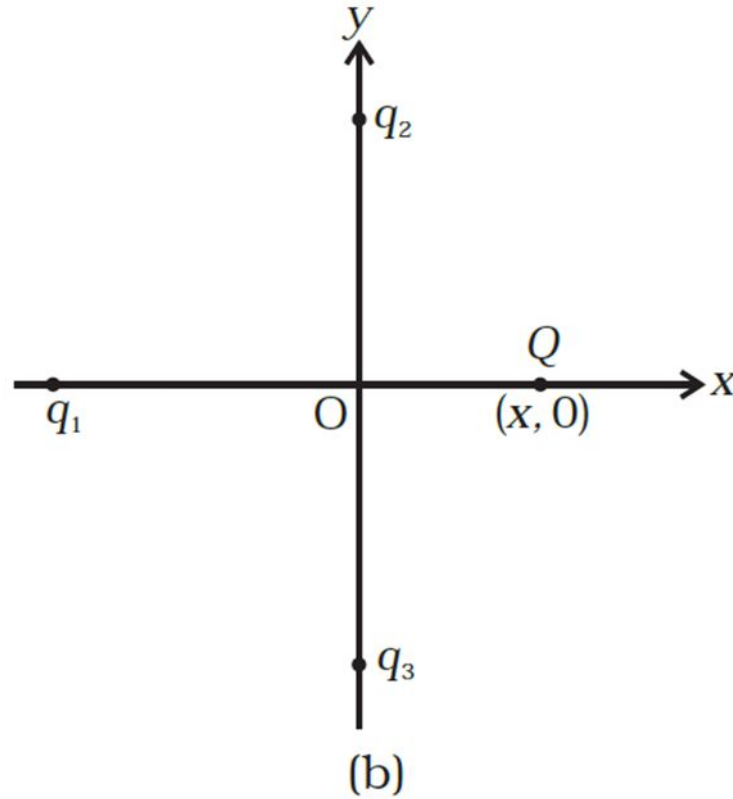
Now if the net force is to act along + x direction
The charge at q_1 should be negative

Draw lines to join q_2 and q_3 to q_1



Now if the net force is to act along + x direction
The charge at q_1 should be negative

If a positive charge Q is added at $(x, 0)$, the force on q_1



If a positive charge Q is added at $(x, 0)$, the force on q_1 shall increase along the positive x -axis

The positive charge at Q attracts the negative charge at q_1

Hence increasing the force on q_1 in the positive x direction

How would the situation change if the net force due to q_2 and q_3 was in the negative x direction ?

How would the situation change if the location of q_2 and q_3 was not symmetrical about the x axis ?

Think of different conditions for q_2 and q_3 and figure out the direction of net force with the addition of Q in the field of the three charges