Q.1. If a point C lies between two points A and B such that AC = BC, then prove that AC =1/2AB. Explain by drawing the figure.

Solution. According to the given statement, the figure will be as shown alongside in which the

point C lies between two points A and B

such that AC = BC.
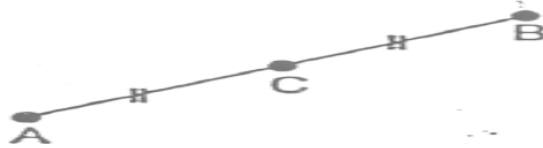
Clearly, AC + BC = AB

$\Rightarrow$ AC + AC = AB [AC = BC]

$\Rightarrow$ 2AC = AB   And, AC = ½ AB

Q.2. How would you rewrite Euclid' fifth postulate so that it would be easier to understand?

Solution: Two distinct intersecting lines cannot be parallel to the same line.

Q.3. Does Euclid's fifth postulate imply the existence of parallel lines ? Explain.

Solution : if a straight line l falls on two straight lines m and n such that sum of the interior angles on one side of l is two right angles, then by Euclid's fifth postulate the line will not meet on this side of l . Next, we know that the sum of the interior angles on the other side of line l also be two right angles. Therefore they will not meet on the other side. So, the lines m and n never meet and are, therefore parallel.

Q.4. If lines AB, AC, AD and AE are parallel to a line l , then points A, B, C, D and E are collinear.

Solution: Given : Lines AB, AC, AD and AE are parallel to a line l .

To prove : A, B, C, D, E are collinear.

Proof : Since AB, AC, AD and AE are all parallel to a line l Therefore point A is outside   and lines AB,

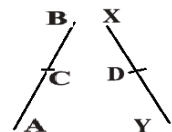AC, AD, AE are drawn through A and each line is parallel to l .

But by parallel lines axiom, one and only one line can be drawn through the point A outside it and parallel to l .

This is possible only when A, B, C, D, and E all lie on the same line. Hence, A, B, C, D and E are collinear.

Q.5. we have: AC = XD, C is the mid-point of AB and D is the mid-point of XY.

Using an Euclid's axiom, show that AB = XY.

Solution : AB = 2AC (C is the mid-point of AB) and XY = 2XD (D is the mid-point of XY)

Also, AC = XD (Given) $\Rightarrow$ Therefore, AB = XY, because things which are double of the same things are equal to one another.