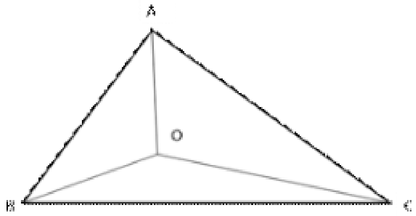
Exercise 5A

Question 44:
Given : ABC is a triangle and O is appoint inside it.



To Prove : (i) AB+AC > OB +OC
(ii) AB+BC+CA > OA+OB+OC
(iii) OA+OB+OC > 1/2 (AB+BC+CA)
Proof:
(i) In ΔABC,
AB+AC > BC ....(i)
And in , ΔOBC,
OB+OC > BC ....(ii)
Subtracting (i) from (i) we get
(AB+AC) - (OB+OC) > (BC-BC)
i.e. AB+AC>OB+OC
(ii) AB+AC > OB+OC [proved in (i)]
Similarly, AB+BC > OA+OC
And AC+BC > OA +OB
Adding both sides of these three inequalities, we get
(AB+AC) + (AC+BC) + (AB+BC) > OB+OC+OA+OB+OA+OC
i.e. 2(AB+BC+AC) > 2(OA+OB+OC)
Therefore, we have
AB+BC+AC > OA+OB+OC
(iii) In ΔOAB
OA+OB > AB ....(i)
In ΔOBC,
OB+OC > BC ....(ii)
And, in ΔOCA,
OC+OA > CA
Adding (i), (ii) and (iii) we get
(OA+OB) + (OB+OC) + (OC+OA) > AB+BC+CA
i.e 2(OA+OB+OC) > AB+BC+CA
$\Rightarrow$ OA+OB+OC > 1/2 (AB+BC+CA)

Question 45:
Since AB=3cm and BC=3.5 cm
$\therefore$ AB+BC=(3+3.5) cm =6.5 m
And CA=6.5 cm
So AB+BC=CA
A triangle can be drawn only when the sum of two sides is greater than the third side.
So, with the given lengths a triangle cannot be drawn.

*********** END **********