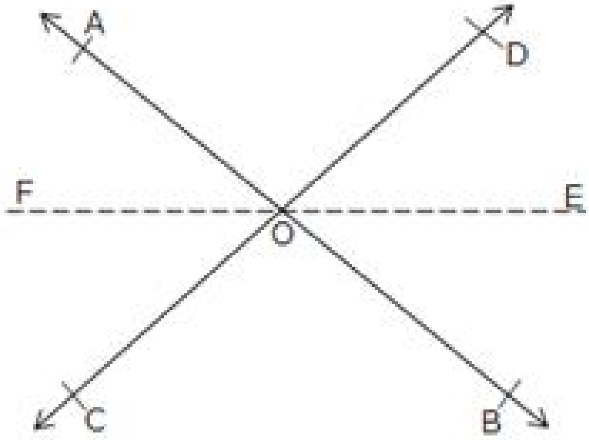
Exercise 4B

Question 14:
Given : AB and CD are two lines which are intersecting at O. OE is a ray bisecting the ∠BOD. OF is a ray opposite to ray OE.



To Prove: ∠AOF = ∠COF

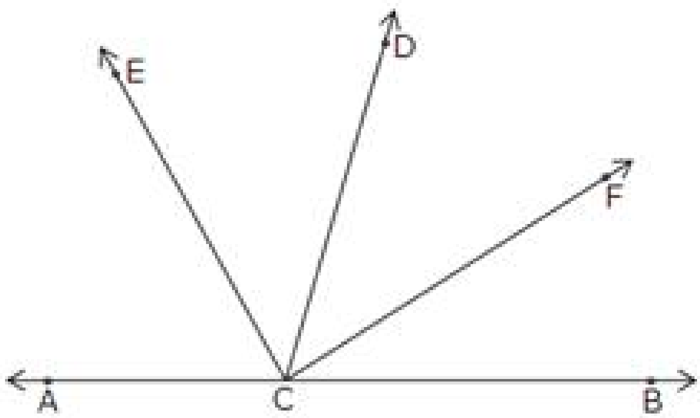
Proof : Since $\overrightarrow{OE}$ and $\overrightarrow{OF}$ are two opposite rays, $\overrightarrow{EF}$ is a straight line passing through O.

∴ ∠AOF = ∠BOE
and ∠COF = ∠DOE
[Vertically opposite angles]
But ∠BOE = ∠DOE (Given)
∴ ∠AOF = ∠COF
Hence, proved.

Question 15:

Given: $\overrightarrow{CF}$ is the bisector of ∠BCD and $\overrightarrow{CE}$ is the bisector of ∠ACD.

To Prove: ∠ECF = 90^o
Proof: Since ∠ACD and ∠BCD forms a linear pair.
∠ACD + ∠BCD = 180^o



∠ACE + ∠ECD + ∠DCF + ∠FCB = 180^o
∠ECD + ∠ECD + ∠DCF + ∠DCF = 180^o
because ∠ACE = ∠ECD
and ∠DCF = ∠FCB

$2(\angle ECD) + 2(\angle CDF) = 180^{\circ}$

$2(\angle ECD + \angle DCF) = 180^{\circ}$

$\angle ECD + \angle DCF = 180/2 = 90^{\circ}$

$\angle ECF = 90^{\circ}$ (Proved)

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