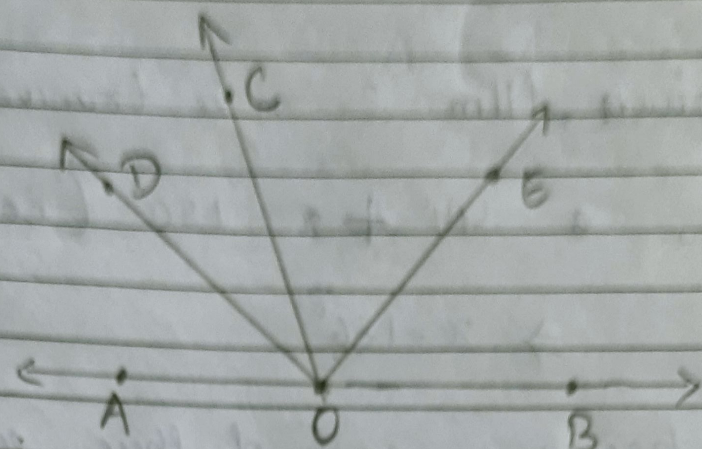
Exercise 6.3

Q1.



Given, OD & OE are bisectors of ~~$\angle AOC$~~ & $\angle AOC$ & $\angle BOC$ respectively.

$\therefore \angle AOD = \angle COD$
& $\angle BOE = \angle COE$

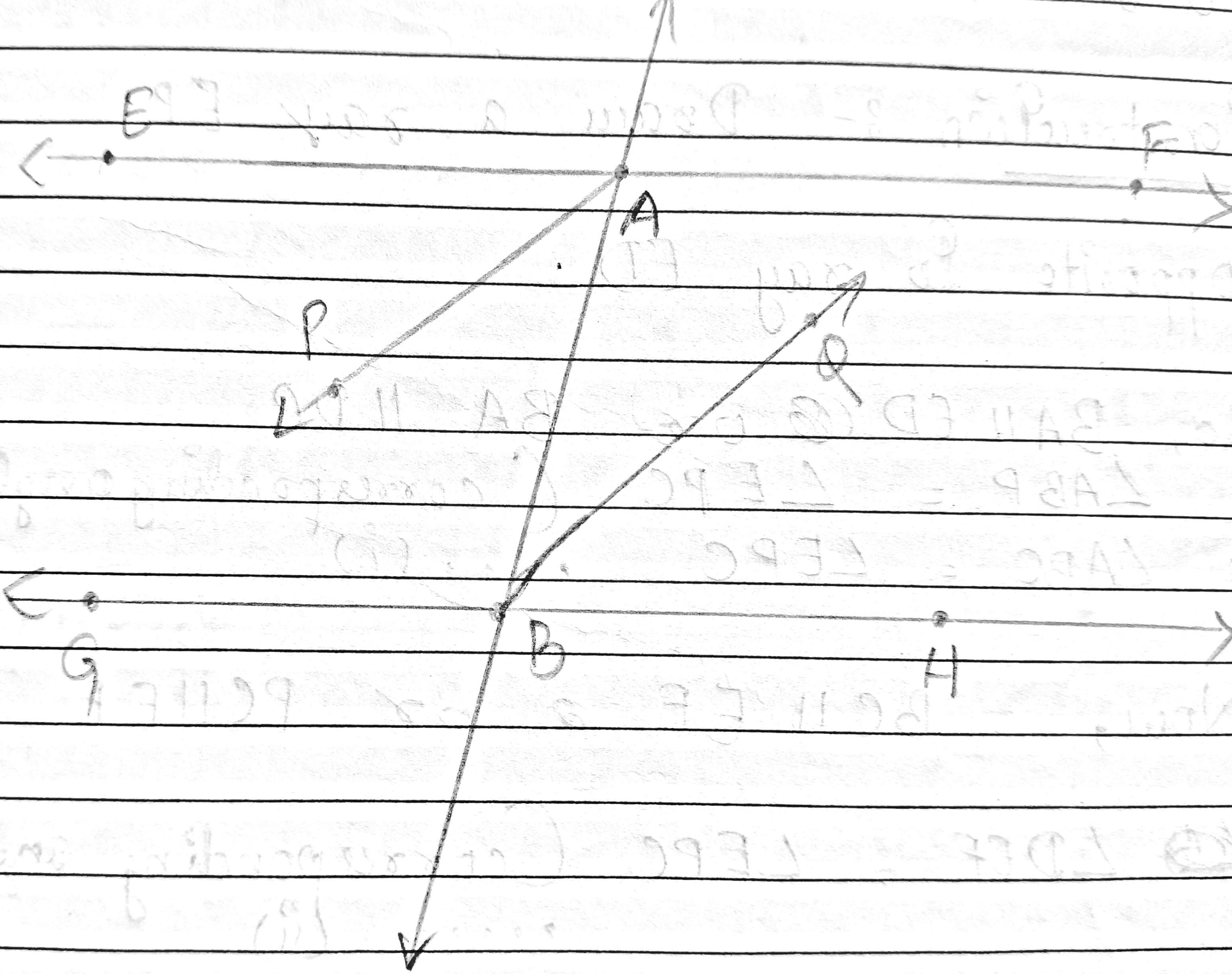
$\because \angle AOC = 2\angle DOC$ ......(i)
$\angle BOC = 2\angle COE$ ....(ii)

By adding eq. (i) & (ii) we get,
$\angle AOC + \angle BOC = 2\angle DOC + 2\angle COE$
,, $= 2(\angle DOC + \angle COE)$

$\therefore \angle AOC + \angle BOC = 2(\angle DOE)$
$\Rightarrow \angle AOC + \angle BOC = 2 \times 90^\circ$
$\Rightarrow \angle AOC + \angle BOC = 180^\circ$
$\therefore \Rightarrow \angle AOB = 180^\circ$

As, $\angle AOB$ is 180°, hence its a straight line. Therefore, A, O, B are collinear points.

3.



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Given, $l \parallel m$ and t is transversal

So, $\angle EAB = \angle HBA$ (Alternate Int. angles)

As AP & BQ are bisectors,

$\therefore \Rightarrow \frac{\angle EAB}{2} = \frac{\angle HBA}{2}$

$\Rightarrow \angle PAB = \angle ABQ$

Since, $\angle PAB$ & $\angle ABQ$ are alternate int. angles and AB is ~~tran~~ transversal that's why $AP \parallel BQ$

5. Given,

$BA \parallel ED$ & $BC \parallel EF$

To show, $\angle ABC = \angle DEF$

<u>Construction</u> :- Draw a ray EP opposite to ray ED

So, $BA \parallel ED$ or $BA \parallel DP$

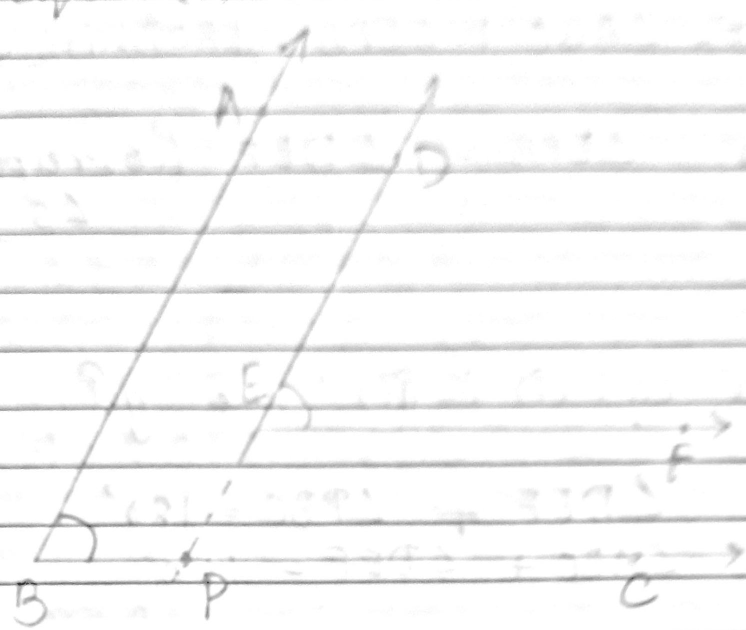
$\therefore \angle ABP = \angle EPC$ (corresponding angles)

$\Rightarrow \angle ABC = \angle EPC$ .... (i)

Now, $BC \parallel EF$ or $PC \parallel EF$

$\therefore \angle DEF = \angle EPC$ (corresponding angles) .... (ii)

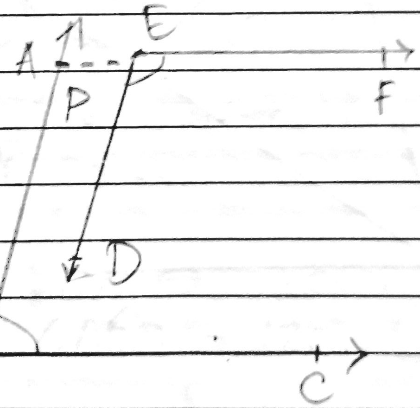
~~From eqn (i) & (ii)~~



From eqns. (i) & (ii)

$$\angle ABC = \angle DEF$$

6.



Given, $BA \parallel ED$ & $BC \parallel EF$

<u>Construction</u>:- Draw a ray PE opposite to ray EF

To show, $\angle ABC + \angle DEF = 180°$

Here, $\angle PBC + \angle EPB = 180^\circ$

$\Rightarrow \angle ABC + \angle EPB = 180^\circ$ ...(i) (co-int. angles)

Now, $\angle EPB = \angle DEF$ (corresponding $\angle s$) ......(ii)

From eq. (i) & (ii) we get

$\angle DEF + \angle PBC = 180^\circ$

$\therefore \angle ABC + \angle DEF = 180^\circ$