Exercise 6.3

Question 4:

If in Fig. 6.11, bisectors AP and BQ of the alternate interior angles are parallel, then show that $l \parallel m$.

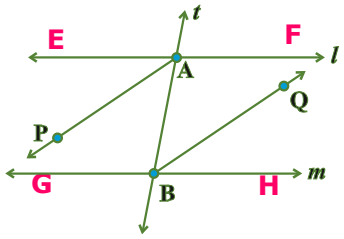

Fig. 6.11

Answer 4:

Given:

In figure AP$\parallel BQ$, AP and BQ are the bisectors of alternate interior angles $\angle$CAB and $\angle$ABF.

To prove:

$l \parallel m$

Proof:

Since, AP $\parallel BQ$ and t is transversal, therefore

$$\angle \text{PAB} = \angle \text{ABQ} \qquad \text{[alternate interior angles]}$$

$$\Rightarrow \quad 2\angle PAB = 2\angle ABQ$$

[multiplying both sides by 2]

$$\Rightarrow \quad \angle EAB = \angle ABH$$

Now, alternate interior angles are equal, so the lines l and m are parallel.

[If two alternate interior angles are equal, then lines are parallel]