

Mathematics

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(Chapter – 6) (Lines and Angles)(Exemplar Problems)

(Class – IX)

Exercise 6.3

Question 6:

In Fig. 6.13, $BA \parallel ED$ and $BC \parallel EF$. Show that $\angle ABC + \angle DEF = 180^\circ$

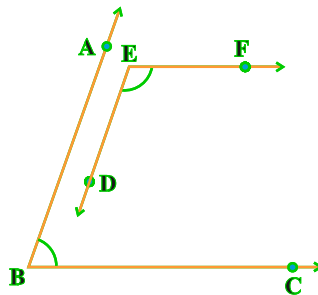


Fig. 6.13

Answer 6:

Given:

In figure, $BA \parallel ED$ and $BC \parallel EF$.

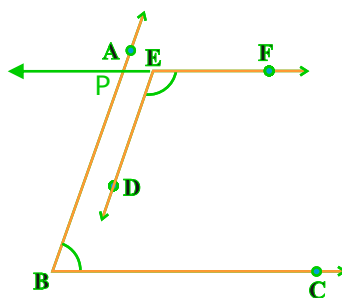
To prove:

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



Construction:

Draw a ray PE opposite to ray EF.



Proof:

In figure, $BC \parallel EF$

$\therefore \angle EPB + \angle PBC = 180^\circ$... (i)

[sum of cointerior angles is 180°]

Now, $AB \parallel ED$ and PE is a transversal line.



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$$\therefore \quad \angle EPB = \angle DEF \quad \dots \text{ (ii)}$$

[corresponding angles]

From equations (i) and (ii), we get

$$\begin{aligned} & \angle DEF + \angle PBC = 180^\circ \\ \Rightarrow & \angle ABC = \angle DEF = 180^\circ \quad [\because \angle PBC = \angle ABC] \end{aligned}$$

Hence proved.

