



Understanding shapes-III special types of quadrilaterals Ex 17.1 Q20

**Answer :**

In  $\triangle CEB$  :

$$\angle ECB + \angle CBE + \angle BEC = 180^\circ \quad (\text{angle sum property of a triangle})$$

$$40^\circ + 90^\circ + \angle EBC = 180^\circ$$

$$\therefore \angle EBC = 50^\circ$$

Also,  $\angle EBC = \angle ADC = 50^\circ$  (opposite angle of a parallelogram)

In  $\triangle FDC$  :

$$\angle FDC + \angle DCF + \angle CFD = 180^\circ$$

$$50^\circ + 90^\circ + \angle DCF = 180^\circ$$

$$\therefore \angle DCF = 40^\circ$$

$$\text{Now, } \angle BCE + \angle ECF + \angle FCD + \angle FDC = 180^\circ$$

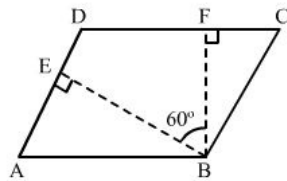
(in a parallelogram, the sum of alternate angles is  $180^\circ$ )

$$50^\circ + 40^\circ + \angle ECF + 40^\circ = 180^\circ$$

$$\angle ECF = 180^\circ - 50^\circ + 40^\circ - 40^\circ = 50^\circ$$

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**Answer :**



Draw a parallelogram ABCD.

Drop a perpendicular from B to the side AD, at the point E.

Drop perpendicular from B to the side CD, at the point F.

In the quadrilateral BEDF :

$$\angle EBF = 60^\circ, \angle BED = 90^\circ$$

$$\angle BFD = 90^\circ$$

$$\angle EDF = 360^\circ - (60^\circ + 90^\circ + 90^\circ) = 120^\circ$$

In a parallelogram, opposite angles are congruent and adjacent angles are supplementary.

In the parallelogram ABCD :

$$\angle B = \angle D = 120^\circ$$

$$\angle A = \angle C = 180^\circ - 120^\circ = 60^\circ$$

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**Answer :**

Both the parallelograms ABCD and AEFB are similar.

$$\therefore \angle C = \angle A = 55^\circ \quad (\text{opposite angles of a parallelogram are equal})$$

$$\therefore \angle A = \angle F = 55^\circ \quad (\text{opposite angles of a parallelogram are equal})$$

\*\*\*\*\* END \*\*\*\*\*