Understanding shapes-III special types of quadrilaterals Ex 17.1 Q23

Answer :

In parallelogram BDEF

$\therefore$ BD = EF ...(i) (opposite sides of a parallelogram are equal)

In parallelogram DCEF

CD = EF ...(ii) (opposite sides of a parallelogram are equal)

From equations (i) and (ii)

BD = CD

Understanding shapes-III special types of quadrilaterals Ex 17.1 Q24

Answer :

In $\triangle$FDE :

DE = DF

$\therefore \angle FED = \angle DFE$..... (i) (angles opposite to equal sides)

In the II^{gm} BDEF :

$\angle FBD = \angle FED$..... (ii) (opposite angles of a parallelogram are equal)

In the II^{gm} DCEF :

$\angle DCE = \angle DFE$..... (iii) (opposite angles of a parallelogram are equal)

From equations (i), (ii) and (iii) :

$\angle FBD = \angle DCE$

In $\triangle$ ABC :

If $\angle FBD = \angle DCE$, then AB = AC (sides opposite to equal angles).

Hence, $\triangle$ ABC is isosceles.

Understanding shapes-III special types of quadrilaterals Ex 17.1 Q25

Answer :

(i) Diagonals of a parallelogram bisect each other.

(ii) Alternate angles

(iii) Vertically opposite angles

(iv)

In $\triangle$BOY and $\triangle$DOX :

OB = OD (diagonals of a parallelogram bisect each other)

$\angle OBY = \angle ODX$ (alternate angles)

$\angle BOY = \angle DOX$ (vertically opposite angles)

ASA congruence:

XO = YO (c.p.c.t)

So, XY is bisected at O.

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