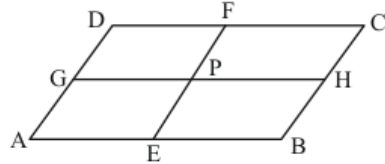




Quadrilaterals Ex 14.4 Q17

Answer :

$ABCD$ is a parallelogram with E and F as the mid-points of AB and CD respectively.



We need to prove that $GP = PH$

Since E and F are the mid-points of AB and CD respectively.

Therefore,

$$BE = \frac{1}{2} AB, \quad AE = BE$$

And

$$DF = \frac{1}{2} CD, \quad DF = CF$$

Also, $ABCD$ is a parallelogram. Therefore, the opposite sides should be equal.

Thus,

$$AB = CD$$

$$\frac{1}{2} AB = \frac{1}{2} CD$$

$$BE = CF$$

Also, $BE \parallel CF$ (Because $AB \parallel CD$)

Therefore, $BEFC$ is a parallelogram

Therefore, $BEFC$ is a parallelogram

Then, $BC \parallel EF$ and $BE = PH$ (i)

Now, $BC \parallel EF$

Thus, $AD \parallel EF$ (Because $BC \parallel AD$ as $ABCD$ is a parallelogram)

We get,

$AEFD$ is a parallelogram

Then, we get:

$$AE = GP \quad \text{..... (ii)}$$

But, E is the mid-point of AB .

Therefore,

$$AE = BE$$

Using (i) and (ii), we get:

$$\boxed{GP = PH}$$

Hence proved.

***** END *****