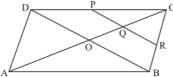


## Quadrilaterals Ex 14.4 Q15 Answer:

Figure is given as follows:



ABCD is a parallelogram, where P is the mid-point of DC and Q is a point on AC such that

$$CQ = \frac{1}{4}AC$$

PQ produced meets BC at R.

We need to prove that R is a mid-point of BC.

Let us join BD to meet AC at O.

It is given that ABCD is a parallelogram.

Therefore,  $OC = \frac{1}{2}AC$  (Because diagonals of a parallelogram bisect each other)

Also, 
$$CQ = \frac{1}{4}AC$$

Therefore,  $CQ = \frac{1}{2}OC$ 

In  $\Delta DCO$ , P and Q are the mid-points of CD and OC respectively.

Theorem states, the line segment joining the mid-points of any two sides of a triangle is parallel to the third side and equal to half of it.

Therefore, we get:  $PQ \parallel DO$ 

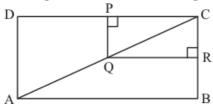
Also, in  $\triangle COB$ , Q is the mid-point of OC and  $QR \parallel OB$ Therefore, R is a mid-point of BC.

Hence proved.

Quadrilaterals Ex 14.4 Q16

## Answer:

Rectangles ABCD and PQRC are given as follows:



Q is the mid-point of AC.

In  $\Delta ADC$  , Q is the mid-point of AC such that  $PQ \parallel AD$ 

Using the converse of mid-point theorem, we get:

P is the mid-point of DC

That is;

$$DP = PC$$

Similarly, R is the mid-point of BC.

Now, in  $\Delta BCD$ , P and R are the mid-points of DC and BC respectively.

Then, by mid-point theorem, we get:

$$PR = \frac{1}{2}BD$$

Now, diagonals of a rectangle are equal.

Therefore putting BD = AC , we get:

$$PR = \frac{1}{2}AC$$

Hence Proved.

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