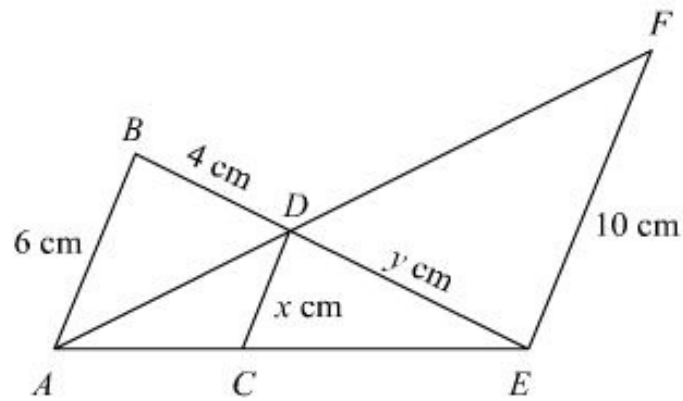Triangles Ex 4.5 Q17

Answer :

It is given that $AB \parallel CD \parallel EF$.

$AB = 6$cm, $CD = x$cm and $EF = 10$cm

We have to calculate the values of x and y.

In $\triangle ADB$ and $\triangle DEF$, we have

$\angle ADB = \angle EDF$ (Vertically opposite angles)

$\Rightarrow \angle ABD = \angle DEF$ (Alternate interior angles)

So $\triangle ADB \sim \triangle DEF$

$$\frac{EF}{AB} = \frac{OE}{OB}$$

$$\frac{10cm}{6cm} = \frac{y}{4cm}$$

$$6cm \times y = 40cm$$

$$y = \frac{40cm}{6cm}$$

$$y = 6.67cm$$

Similarly in $\triangle ABE$ we have

$$\frac{OC}{AB} = \frac{OE}{OB}$$

$$\frac{4}{6.7}cm = \frac{x}{6}cm$$

$$6.7cm \times x = 6cm \times 4cm$$

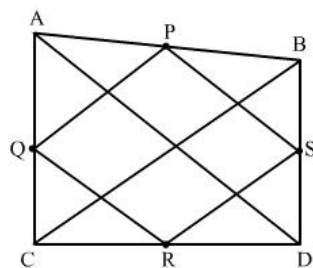$$x = \frac{24}{6.7}cm$$

$$x = 3.78cm$$

Hence $\boxed{x = 3.78cm}$ and $\boxed{y = 6.67cm}$

Triangles Ex 4.5 Q18

Answer :

Given:

ABCD is quadrilateral in which AD = BC and P, Q, R, S are the mid points of AB, AC, CD, BD respectively.

To Prove:

PQRS is a rhombus.

Proof:

In $\triangle ABC$, P and Q are the midpoints of the sides AB and AC respectively.

By the Mid point theorem, we get

PQ || BC and PQ = $\frac{1}{2}$BC   ...(1)

In ∆ADC, Q and R are the midpoints of the sides AC and DC respectively.

By the Mid point theorem, we get

QR || AD and QR = $\frac{1}{2}$AD = $\frac{1}{2}$BC   (Since AD = BC)   ...(2)

Similarly, in ∆BCD, we have

RS || BC and RS = $\frac{1}{2}$BC   ...(3)

In ∆BAD, we have

PS || AD and PS = $\frac{1}{2}$AD = $\frac{1}{2}$BC   (Since AD = BC)   ...(4)

From the equations (1), (2), (3), (4), we get

PQ = QR = RS = RS

Thus, PQRS is a rhombus.

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