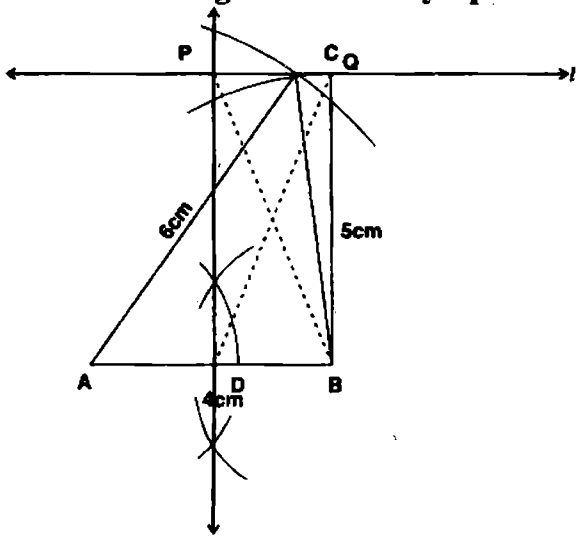
Exercise 17.4

1. Construct a Δ with sides 4 cm, 5 cm and 6 cm and construct a rectangle having its area equal to that of the Δ. Measure its diagonals. Are they equal?



Given

4cm, 5cm, 6cm the sides of the triangle Δ.

Required

To make a rectangle with area equal to that of the Δ.

Construction

(i) Draw $\overline{AB} = 4cm$.

(ii) Draw an arc of radius 5cm with centre B and an other arc of radius 6cm with centre A cutting the first in C.

(iii) Join CA, CB

(iv) ABC is the required Δ.

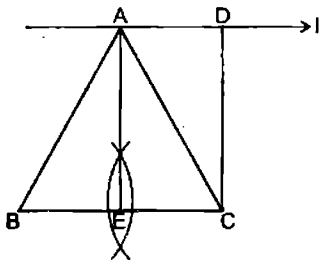
(v) Draw a line ℓ through C $\parallel \overline{AB}$.

(vi) Draw the $\perp$ bisector of $\overline{AB}$ in D and cutting the line ℓ at P.

(vii) Draw BQ $\perp$ on the line ℓ.

PQDB is the required rectangle.

2. Transform an isosceles Δ into a rectangle.



Construction

(i) Take a line $\overline{BC}$

(ii) Draw the $\perp$ bisector of $\overline{BC}$ take any point A on it.

(iii) Join AB and AC.

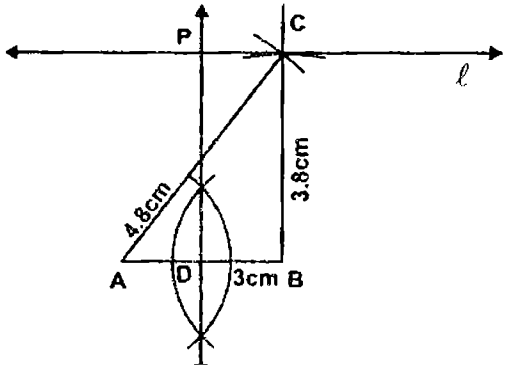
(iv) ΔABC is the isosceles Δ with $m\overline{AB} = m\overline{AC}$.

(v) Through A draw a line $\ell \parallel BC$.

(vi) Draw $\overline{CD} \perp \ell$

CDAE is the required rectangle equal in area to ΔABC

3. Construct a ΔABC such that $m\overline{AB}=3cm, m\overline{BC}=3.8cm, m\overline{AC}=4.8cm$. Construct a rectangle equal in area to the ΔABC, and measure its sides.



Given

Three sides of the ΔABC

Required

To construct a rectangle with area equal to that of the ΔABC.

Construction

(i) Take $m\overline{AB} = 3cm$

(ii) With B as centre draw an arc of radius 3.8cm, with A as centre draw another arc of radius 4.8cm, cutting the first in C.

(iii) Join B with C and A.

(iv) ABC is the required Δ.

(v) Through C draw a line $\ell \parallel \overline{AB}$.

(vi) Draw the $\perp$ bisector of $\overline{AB}$ cutting the line ℓ in P.

(vii) PCDB is the required rectangle.

Measures of sides of rectangle PCDB are;

$m\overline{PD} = 3.8cm$, $m\overline{DB} = 1.5cm$