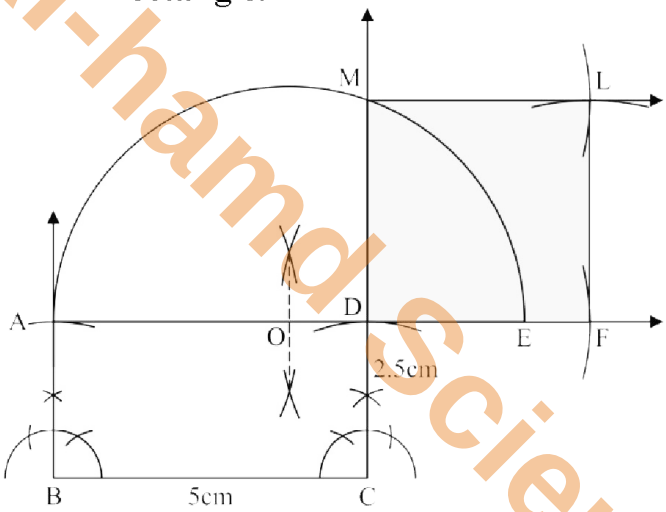
Exercise 17.5

Q.1 **Construct a rectangle whose adjacent sides are 2.5cm and 5cm respectively. Construct a square having area equal to the given rectangle.**



Construction:

i. Make the rectangle ABCD with given lengths of sides.

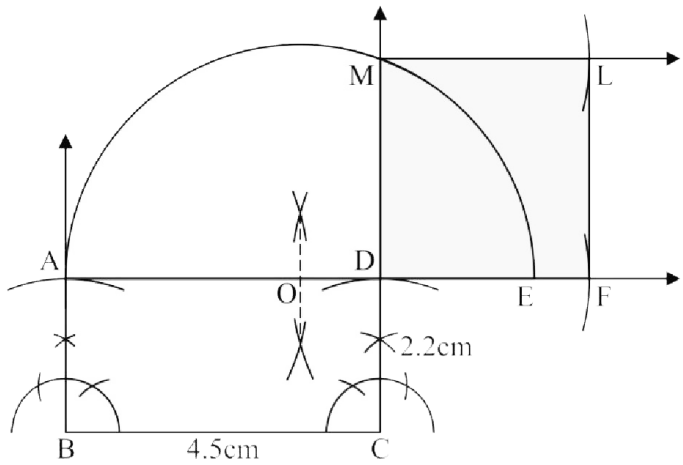
ii. Produce AD to point E such that $m\overline{DE} = m\overline{DC}$.

iii. Bisect $\overline{AE}$ at O.

iv. With O as centre and $\overline{OA}$ radius draw a semicircle cutting $\overline{CD}$ produced in M.

v. With $\overline{DM}$ as side complete the square $DFLM$.

Q.2 **Construct a square equal in area to a rectangle whose adjacent sides are 4.5cm and 2.2cm respectively. Measure the sides of the square and find its area and compare with the area of the rectangle.**



Construction:

i. Make the rectangle ABCD with given sides.

ii. Produce AD and cut $m\overline{DE} = m\overline{DC}$.

iii. Bisect $\overline{AE}$ at O.

iv. With O as centre and $\overline{OA}$ radius draw a semicircle cutting $\overline{CD}$ produced in M.

v. With $\overline{DM}$ as side complete the square $DF\angle M$.

vi. Side of the square (average) = 3.15cm

Area $= 3.15 \times 3.15 = 9.9cm^2$

Area of rectangle $= 2.2 \times 4.5 = 9.9cm^2$

Area of rectangle = Area of square

Q.3 **In Q2 above verify by measurement that the perimeter of the square is less then that of the rectangle.**

Perimeter of rectangle = 2 [length + briclth]

= 2 [4.5 + 2.2]

= 2 [6.7]

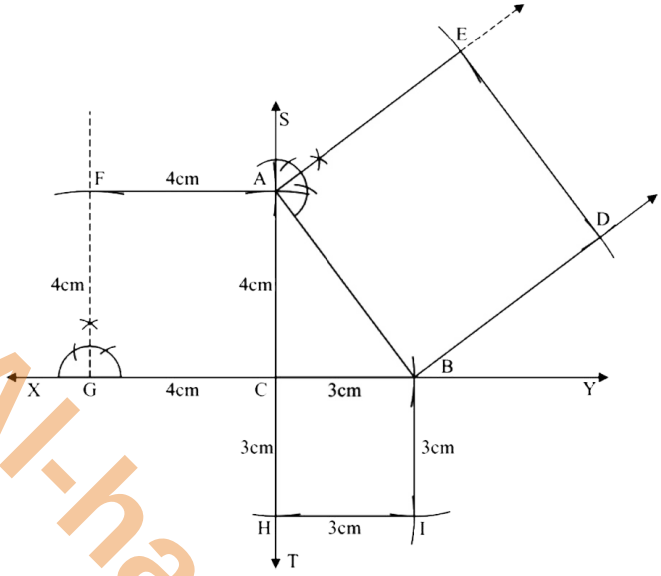
= 13.4 cm

Perimeter of square = $4 \times l$

= 4×3.2

= 12.8 cm

Q.4 **Construct a square equal in area to the sum of two squares having sides 3cm and 4cm respectively.**



Construction:

i. Draw a line segment $\overrightarrow{XY}$.

ii. Draw a line perpendicular $\overrightarrow{ST}$ at point C.

iii. Cut of $\overline{CB} = 3cm$ and $\overline{CG} = 4cm$.

iv. $\overline{CG}$ is the side of square complete the square ACGF.

v. $\overline{CB}$ is the side of square complete the square CBIH.

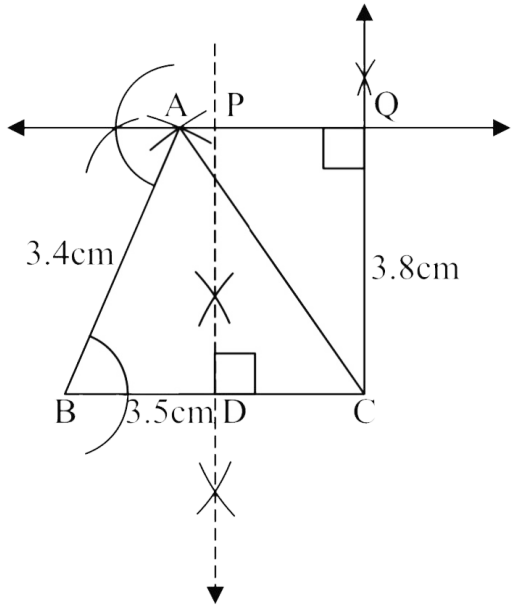
vi. Join B to A.

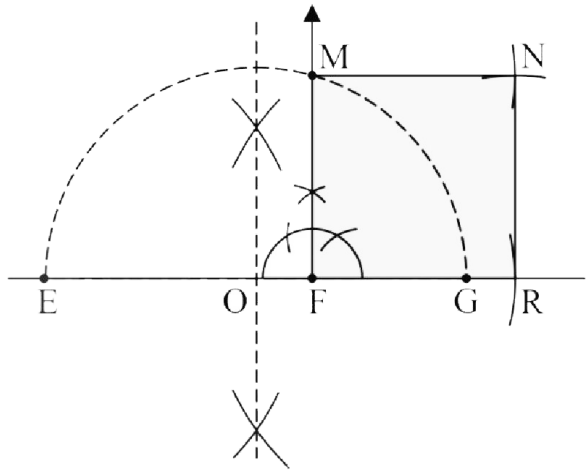
vii. $\overline{AB}$ is the side of square so, complete the square ABDE.

viii. ABDE is the required square.

Using Pythagoras theorem to prove.

Q.5 Construct a Δ having base 3.5cm and other two sides equal to 3.4cm and 3.8cm respectively. Transform it into a square of equal area





Construction:

i. Draw $\overleftrightarrow{PAQ} \parallel \overline{BC}$

ii. Draw perpendicular bisector of $\overline{BC}$, bisector it at D and meeting $\overleftrightarrow{PAQ}$ at P.

iii. Draw $\overline{CQ} \perp \overline{PQ}$ meeting it in Q.

iv. Take a line EFG and cut radius $\overline{EF} = \overline{DP}$ and $\overline{FG} = \overline{DC}$.

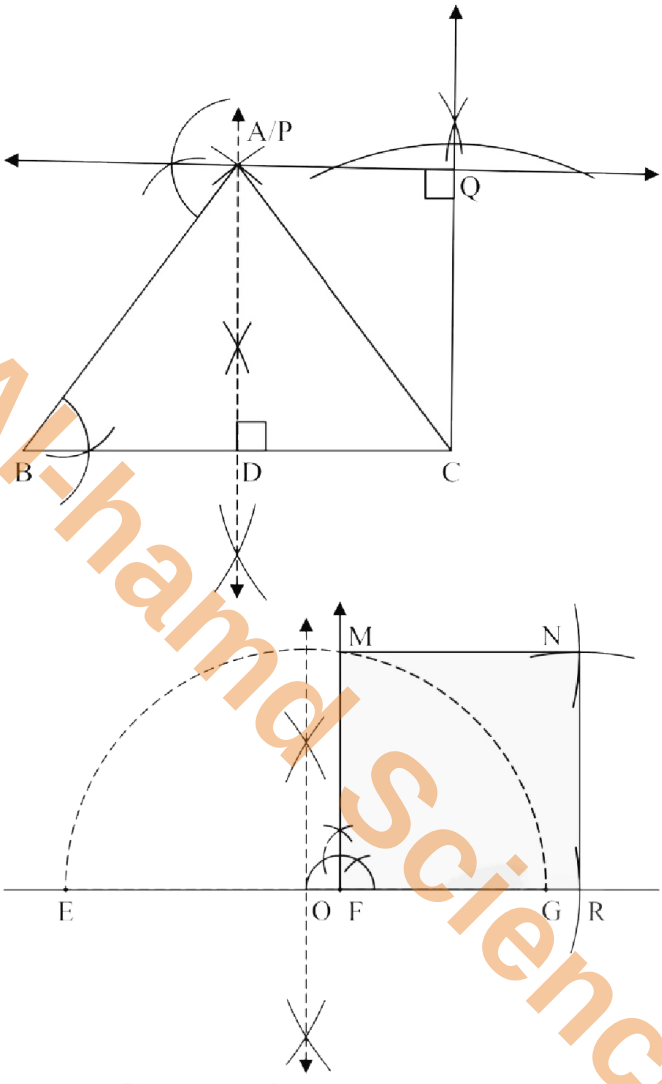
v. Bisect $\overline{EG}$ at O.

vi. With O as centre and radius $= \overline{OE}$ draw a semi-circle.

vii. At F draw $\overline{FM} \perp \overline{EG}$ meeting the semi-circle at M.

viii. With $\overline{MF}$ as a side, complete the required square FMNR.

Q.6 Construct a Δ having base 5 and other sides equal to 5cm and 6cm construct a square equal in area to given Δ.



Construction:

i. Draw $\overleftrightarrow{PAQ} \parallel \overline{BC}$

ii. Draw perpendicular bisector of $\overline{BC}$, bisector it at D and meeting $\overleftrightarrow{PAQ}$ at P.

iii. Draw $\overline{CQ} \perp \overline{PQ}$ meeting it in Q.

iv. Take a line EFG and cut radius $\overline{EF} = \overline{DP}$ and $\overline{FG} = \overline{DC}$.

v. Bisect $\overline{EG}$ at O.

vi. With O as centre and radius $= \overline{OE}$ draw a semi-circle.

vii. At F draw $\overline{FM} \perp \overline{EG}$ meeting the semi-circle at M.

viii. With $\overline{MF}$ as a side, complete the required square FMNR.