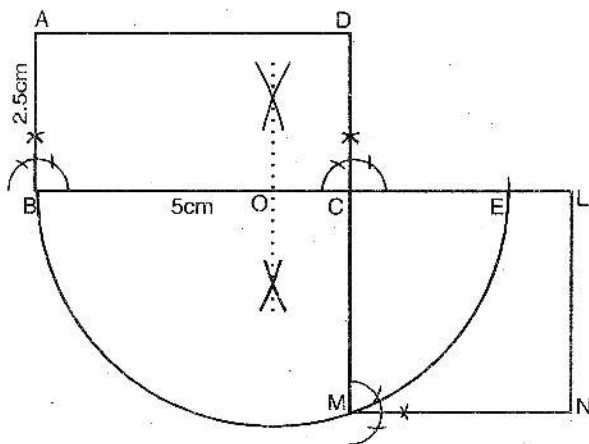


Exercise 17.5

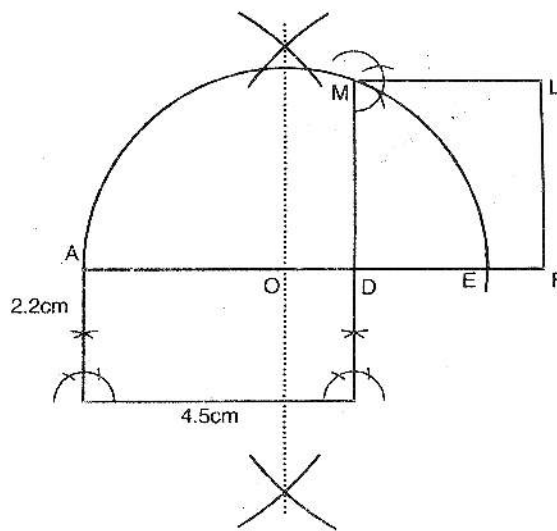
1. Construct a rectangle whose adjacent sides are 2.5 cm and 5cm respectively. Construct a square having area equal to the given rectangle.



Construction

- (i) Make the rectangle ABCD with given lengths of sides.
- (ii) Produce $\overline{BC}$ and cut $m\overline{CE} = m\overline{CD}$
- (iii) Bisect $\overline{BE}$ at O.
- (iv) With O as centre and $\overline{OB}$ radius draw a semicircle cutting $\overline{DC}$ produced in M.
- (v) With $\overline{CM}$ as side complete the square CMNL.

2. Construct a square equal in area to a rectangle whose adjacent sides are 4.5 cm and 2.2 cm 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 $\overline{AD}$ 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 DFLM.
- (vi) Side of the square (average) = 3.15cm
 $\text{Area} = 3.15 \times 3.15 = 9.9\text{cm}^2$
 $\text{Area of the rectangle} = 2.2 \times 4.5 = 9.9\text{cm}^2$ (equal to area of square)

3. In Q.2 above verify by measurement that the perimeter of the square is less than that of the rectangle.

Solution

- (i) Side of the square = 3.15cm
 $\text{Perimeter } P_1 = 4 \times 3.15 = 12.60 \text{ cm}$

Sides of the rectangle are 4.5cm, 2.2cm

$$\begin{aligned} \text{Perimeter } P_2 &= 2(4.5 + 2.2) \\ &= 2(6.7) \\ &= 13.4\text{cm} \end{aligned}$$

$P_1 < P_2$ verified

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

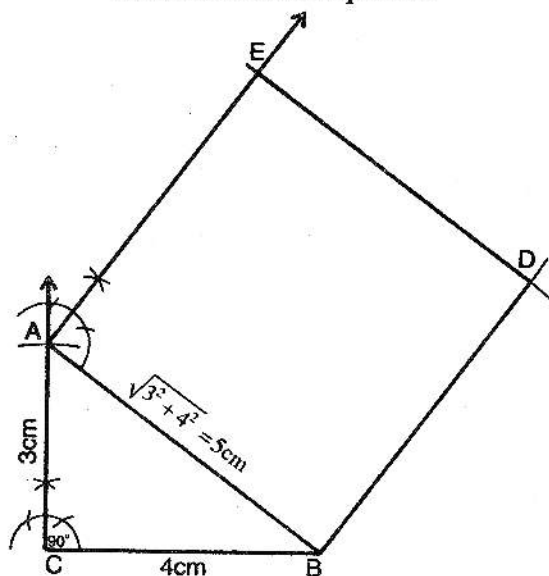
Construction

- (i) Make a right angled $\triangle ABC$ with $\overline{AC} = 3\text{cm}$, $\overline{BC} = 4\text{cm}$.
- (ii) Using Pythagoras theorem

$$\sqrt{|\overline{AC}|^2 + |\overline{BC}|^2} = \sqrt{|\overline{AB}|^2}$$

$$\sqrt{(3)^2 + (4)^2} = \sqrt{|\overline{AB}|^2}$$

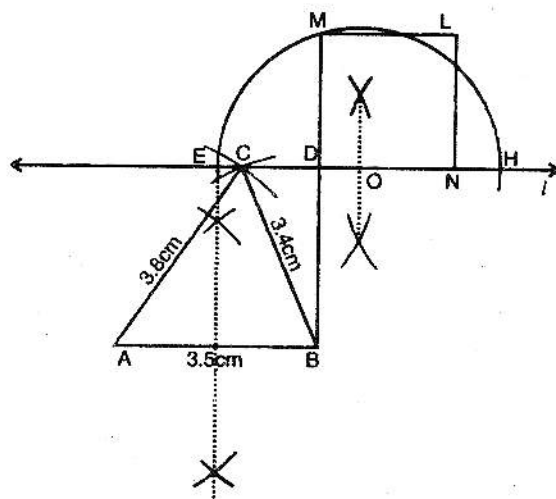
$$5\text{cm} = |\overline{AB}|$$
- (iii) With $\overline{AB}$ as side make square ABDE.



5. Construct a $\triangle$ having base 3.5 cm and other two sides equal to 3.4 cm

6. Construct a $\triangle$ having base 5 cm and other sides equal to 5 cm and 6 cm. Construct a square equal in area to given $\triangle$.

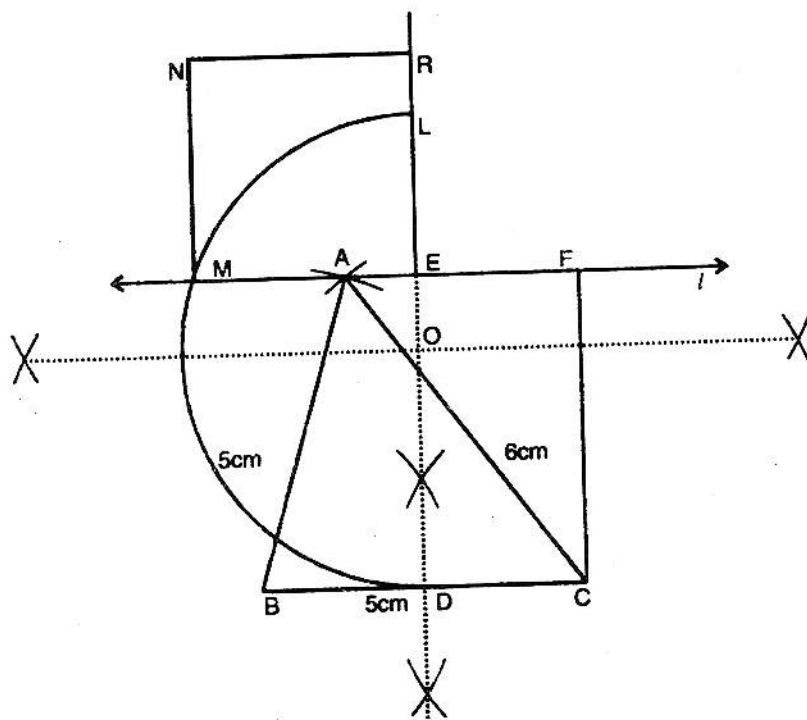
and 3.8 cm respectively. Transform it into a square of equal area.



Construction

- (i) Make the $\triangle ABC$ with the given sides.
- (ii) Draw the $\perp$ bisector of $\overline{AB}$ and a line ℓ through $C \parallel \overline{AB}$ cutting each other in E .
- (iii) Draw $\overline{BD} \perp \ell$.
- (iv) BDEF is a rectangle.
- (v) Produce $\overline{ED}$, cut $\overline{DH} = \overline{DB}$.
- (vi) Bisect $\overline{EH}$ at O .
- (vii) With O as centre and $\overline{OE}$ radius draw a semicircle cutting $\overline{BD}$ produced in M .
- (viii) With $\overline{DM}$ as side, complete the square DNLM.

This is the required square equal in area to $\triangle ABC$.



Construction

- (i) Draw $\overline{BC} = 5\text{cm}$.
- (ii) Draw an arc of radius 6cm with centre C and another arc of radius 5cm with centre B cutting first in A .
- (iii) Through A draw a line $\ell \parallel BC$.
- (iv) Draw the $\perp$ bisector of BC cutting the line ℓ in E .
- (v) Draw $CF \perp$ on ℓ . $CDEF$ is the rectangle.

- (vi) Produce $\overline{DE}$ and cut $\overline{EL} = \overline{EF}$, bisect $\overline{DL}$ at O .
 - (vii) Draw a semicircle with centre O and radius $\overline{OL} = \overline{OD}$, cutting ℓ in M .
 - (viii) Draw a square $EMNR$ with side EM .
- This is the required square equal in area to ΔABC .

OBJECTIVE

1. A triangle having two sides congruent is called: ____
 (a) Scalene (b) Right angled
 (c) Equilateral (d) Isosceles
2. A quadrilateral having each angle equal to 90° is called ____
 (a) Parallelogram (b) Rectangle
 (c) Trapezium (d) Rhombus

3. The right bisectors of the three sides of a triangle are ____
 (a) Congruent (b) Collinear
 (c) Concurrent (d) Parallel
4. The ____ altitudes of an isosceles triangle are congruent:
 (a) Two (b) Three
 (c) Four (d) None

5. A point equidistant from the end points of a line segment is on its ____
 (a) Bisector (b) Right bisector
 (c) Perpendicular (d) Median
6. ____ congruent triangles can be made by joining the mid points of the sides of a triangle:
 (a) Three (b) Four
 (c) Five (d) Two
7. The diagonals of a parallelogram ____ each other:
 (a) Bisect (b) Trisect
 (c) Bisect at right angle
 (d) None of these
8. The median of a triangle cut each other in the ratio:
 (a) 4:1 (b) 3:1
 (c) 2:1 (d) 1:1
9. One angle on the base of an isosceles triangle is 30° . What is the measure of its vertical angle:
 (a) 30° (b) 60°
 (c) 90° (d) 120°
10. If the three altitudes of a triangle are congruent then the triangle is ____
 (a) Equilateral (b) Right angled
 (c) Isosceles (d) Acute angled
11. If two medians of a triangle are congruent then the triangle will be: ____
 (a) Isosceles (b) Equilateral
 (c) Right angled (d) Acute angled
12. A line segment joining a vertex of a triangle to the midpoint of its opposite side is called a ____ of the triangle:
 (a) Altitude (b) Median
 (c) Angle bisector (d) Right bisector
13. A line segment from a vertex of triangle perpendicular to the line containing the opposite side, is called an ____ of the triangle:
 (a) Altitude (b) Median
 (c) Angle bisector (d) Right bisector
14. The point of concurrency of the three altitudes of a Δ is called its ____
 (a) Ortho centre (b) In centre
 (c) Circum centre (d) None
15. The internal bisector of the angle of a triangle meet at a point called the ____ of the triangle:
 (a) In centre (b) Ortho centre
 (c) Circum centre (d) None
16. The point of concurrency of the three perpendicular bisectors of the sides of a triangle is called the ____ of the triangle.
 (a) Circum centre (b) In centre
 (c) Ortho centre (d) None

ANSWER KEY

1.	d	2.	b	3.	c	4.	a	5.	b
6.	b	7.	a	8.	c	9.	d	10.	a
11.	a	12.	b	13.	a	14.	a	15.	a
16.	a								