

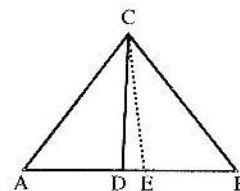
Exercise 16.2

- (1) Show that a median of a triangle divides it into two triangles of equal area.

Given Median of the triangle

To Prove: Median divides the triangle into two triangles of equal area.

Proof Make $\triangle ABC$, with $\overline{CD}$ as median and $\overline{CE}$ as altitude



Statements	Reasons
$m\overline{AD} = m\overline{DB}$(i)	D is midpoint of $m\overline{AB}$
Area of the $\triangle ACD = \frac{1}{2} \cdot m\overline{AD} \cdot m\overline{CE}$... (ii)	
Area of the $\triangle BCD = \frac{1}{2} \cdot m\overline{BD} \cdot m\overline{CE}$	
$= \frac{1}{2} \cdot m\overline{AD} \cdot m\overline{CE}$... (iii)	By (i)
$\triangle ACD = \triangle BCD$	By (ii) and (iii)

- (2) Prove that a parallelogram is divided by its diagonals into four triangles of equal area.

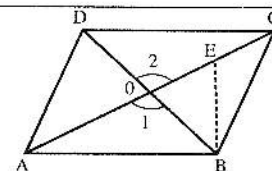
Given

llgm divided by its diagonals into four triangles

To Prove

Areas of the four triangles are equal

Construction Make the llgm ABCD with diagonals $m\overline{AC}$, $m\overline{BD}$ intersecting each other at O. Draw $\overline{BE} \perp \overline{AC}$.



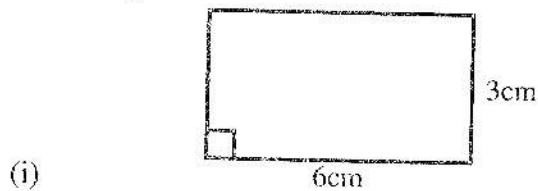
Proof

Statements	Reasons
Area of $\triangle OBC = \frac{1}{2} m\overline{OA} \cdot m\overline{BE}$	
$= \frac{1}{2} m\overline{OC} \cdot m\overline{BE}$(i)	
The diagonals of the llgm bisect each other	
$\therefore m\overline{OA} \cong m\overline{OC}$	
In $\triangle OAB \leftrightarrow \triangle OCD$	
$m\overline{OB} \cong m\overline{OD}$	
$m\overline{OA} \cong m\overline{OC}$	
$\angle 1 \cong \angle 2$	opposite angles
$\triangle OAB \cong \triangle OCD$ (ii)	
$\triangle OAD \cong \triangle OBC$ (iii)	
$\therefore \text{Area } \triangle OAB = \text{Area } \triangle OBC = \text{Area } \triangle OCD = \text{Area } \triangle ODA$	By (i), (ii), (iii)

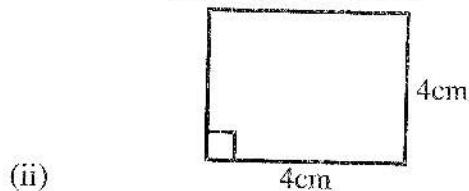
(3) Which of the following are true and which are false?

- | | |
|---|-------|
| (i) Area of a figure means region enclosed by bounding lines of closed figure. | TRUE |
| (ii) Similar figures have same area. | FALSE |
| (iii) Congruent figures have same area. | TRUE |
| (iv) A diagonal of a parallelogram divides it into two non-congruent triangles. | FALSE |
| (v) Altitude of a triangle means perpendicular from vertex to the opposite side (base). | TRUE |
| (vi) Area of a parallelogram is equal to the product of base and height. | TRUE |

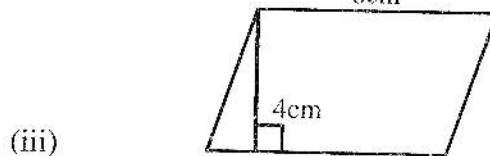
Q.4 Find the area of the following.



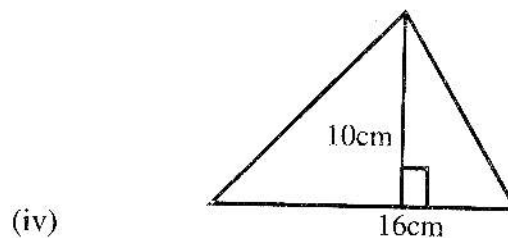
$$\text{Area} = 6 \times 3 = 18\text{cm}^2$$



$$\text{Area} = 4 \times 4 = 16\text{cm}^2$$



$$\text{Area} = 8 \times 4 = 32\text{cm}^2$$



$$\text{Area} = \frac{1}{2} \times 16 \times 10 = 80\text{cm}^2$$

OBJECTIVE

- | | |
|---|---|
| <p>1. The region enclosed by the bounding lines of a closed figure is called the ___ of the figure:</p> <p>(a) Area (b) Circle</p> <p>(c) Boundary (d) None</p> <p>2. Base x altitude =</p> <p>(a) Area of parallelogram</p> <p>(b) Area of square</p> <p>(c) Area of Rectangular</p> <p>(d) None</p> <p>3. The union of a rectangular and its interior is called:</p> <p>(a) Circle region</p> <p>(b) Rectangular region</p> <p>(c) Triangle region</p> <p>(d) None</p> <p>4. If a is the side of a square, its area =</p> | <p>(a) a square unit</p> <p>(b) a^2 square units</p> <p>(c) a^3 square units</p> <p>(d) a^4 square units</p> <p>5. The union of a triangle and its interior is called as:</p> <p>(a) Triangular region</p> <p>(b) Rectangular region</p> <p>(c) Circle region</p> <p>(d) None of these</p> <p>6. Altitude of a triangle means perpendicular distance to base from its opposite:___</p> <p>(a) Vertex (b) Side</p> <p>(c) Midpoint (d) None</p> |
|---|---|

ANSWER KEY

1.	a	2.	a	3.	b	4.	b	5.	a	6.	a
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