



MATHS

NCERT - NCERT MATHEMATICS(GUJRATI ENGLISH)

AREAS

Example

1. ABCD is parallelogram and ABEF is a rectangle and DG is perpendicular on AB.

Prove that (i) $\text{ar}(\text{ABCD}) = \text{ar}(\text{ABEF})$

(ii) $\text{ar}(\text{ABCD}) = AB \times DG$



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2. Triangle ABC and parallelogram ABEF are on the same base, AB as in between the same parallels AB and EF. Prove that $\text{ar}(\Delta ABC) = \frac{1}{2} \text{ar}(\text{gm ABEF})$



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3. Find the area of a figure formed by joining the mid-points of the adjacent sides of a rhombus with diagonals 12 cm. and 16 cm.



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4. Show that the median of a triangle divides it into two triangles of equal areas.

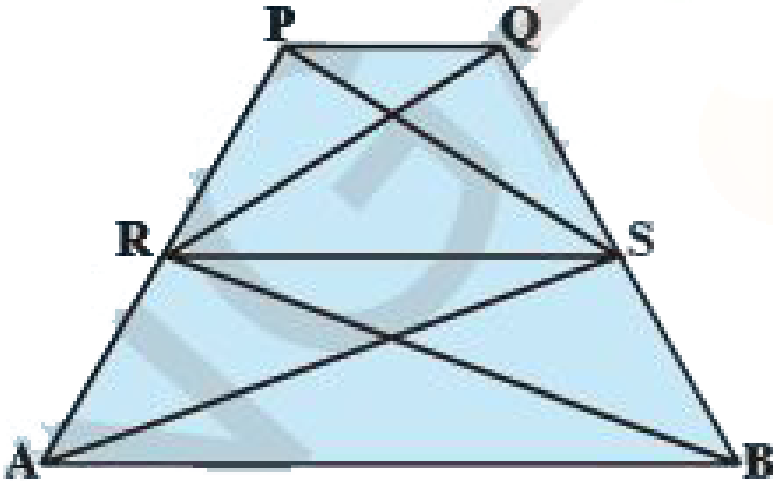


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5. In the figure, ABCD is a quadrilateral. AC is the diagonal and DE || AC and also DE meets BC produced at E. Show that $ar(ABCD) = ar(\triangle ABE)$.

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6. In the figure, if $ar(\triangle RAS) = ar(\triangle RBS)$ and $[ar(\triangle QRB) = ar(\triangle PAS)]$ then show that both the quadrilaterals PQSR and RSBA are trapeziums.



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Think Discuss And Write

1. If 1cm represents 5m, what would be an area of 6 square cm. represent ?

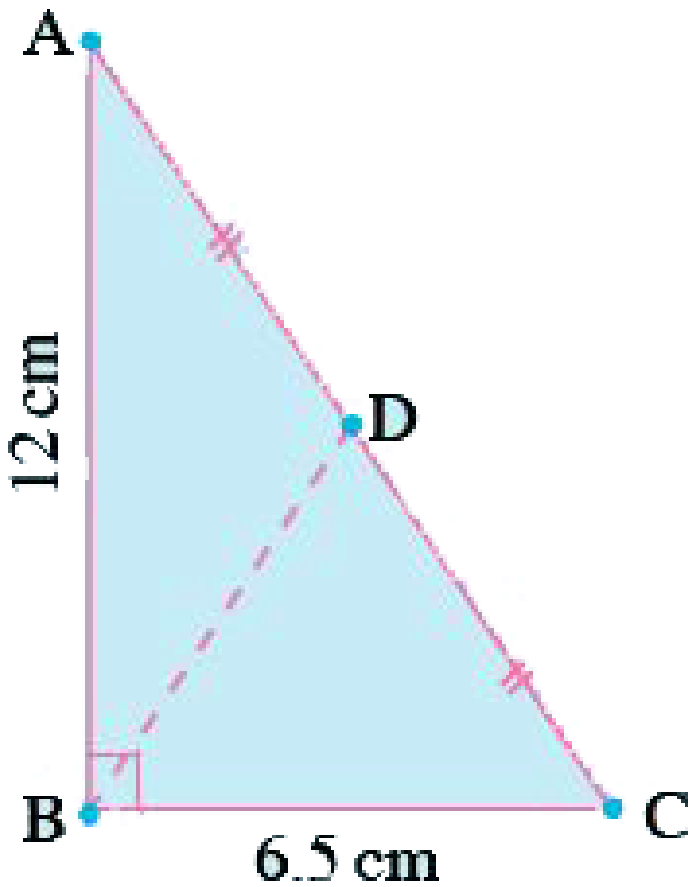
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2. Rajni says $1 \text{ sq.m} = 100^2 \text{ sq.cm}$. Do you agree? Explain.

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Exercise 11 1

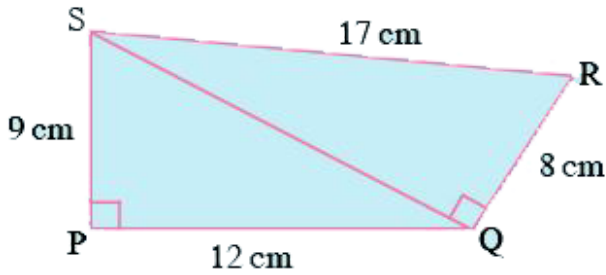
1. In $\triangle ABC$, $\angle ABC = 90^\circ$, $AD = DC$, $AB = 12\text{cm}$ and $BC = 6.5$ cm. Find the area of $\triangle ADB$.



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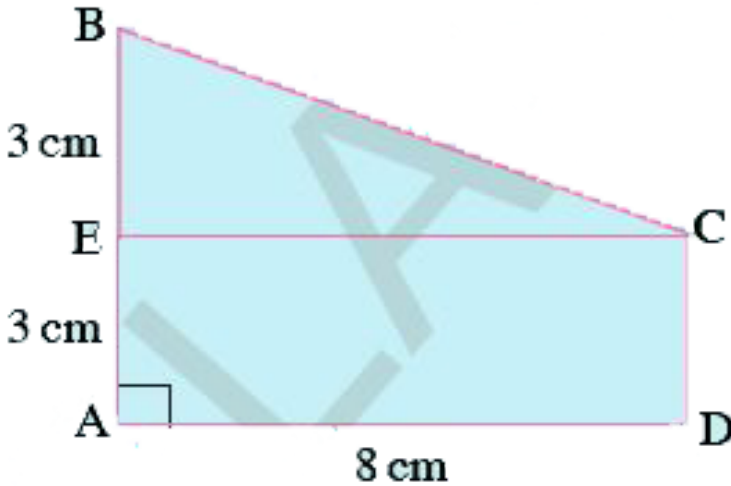
2. Find the area of a quadrilateral PQRS in which $\angle QPS = \angle SQR = 90^\circ$, $PQ = 12\text{cm}$, $PS = 9\text{cm}$, $QR = 8\text{cm}$ and $SR =$

(Hint: PQRS has two parts)



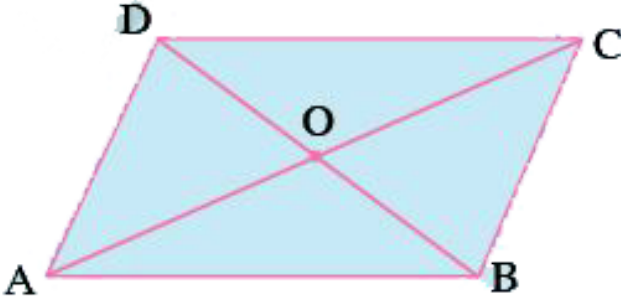
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3. Find the area of trapezium ABCD as given in the figure in which ADCE is a rectangle. (Hint: ABCD has two parts)



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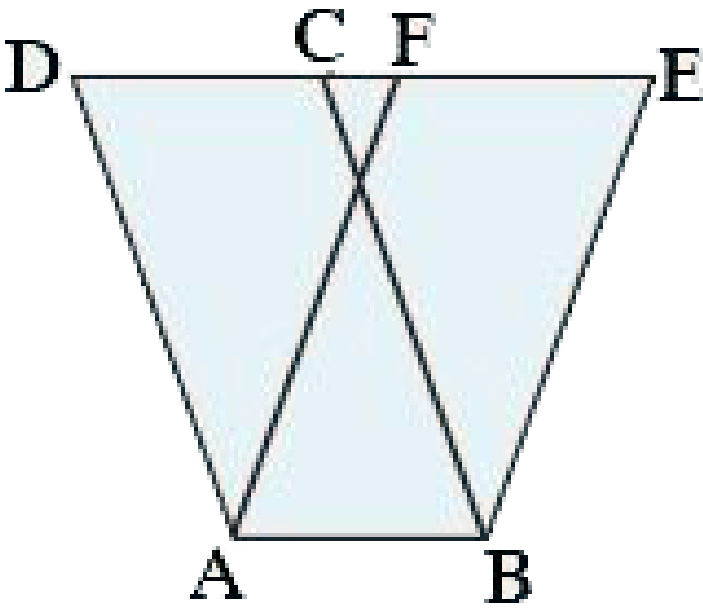
4. ABCD is a parallelogram. The diagonals AC and BD intersect each other at 'O'. Prove that $ar(\triangle AOD) = ar(\triangle BOC)$. (Hint: Congruent figures have equal area)



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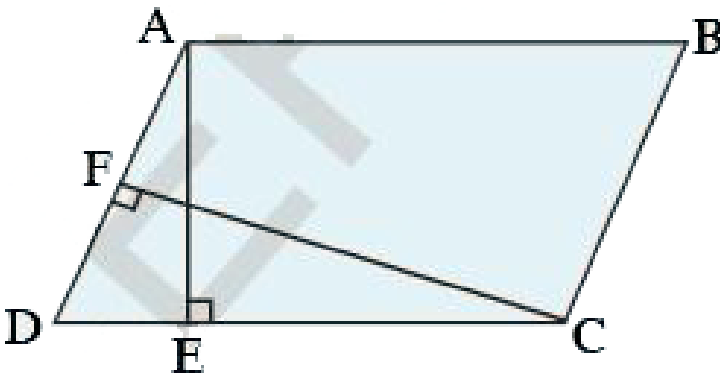
Exercise 11 2

1. The area of parallelogram ABCD is 36cm^2 . Calculate the height of parallelogram ABEF if $AB = 4.2\text{ cm}$



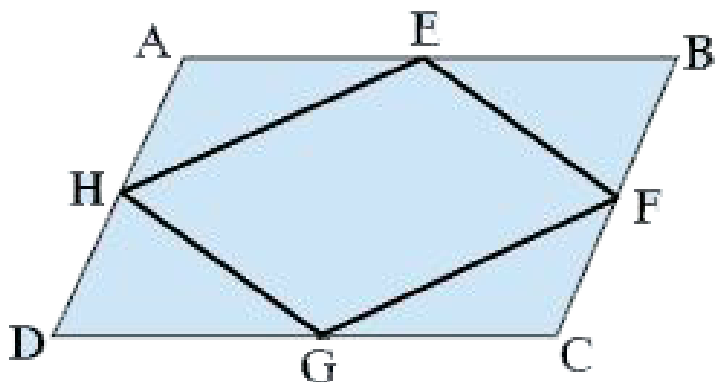
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2. ABCD is a parallelogram. AE is perpendicular on DC and CF is perpendicular on AD. If $AB = 10$ cm, $AE = 8$ cm and $CF = 12$ cm. Find AD.



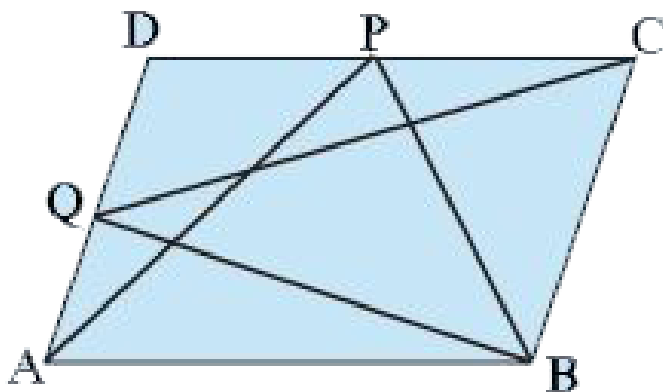
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3. If E, F, G and H are respectively the midpoints of the sides AB, BC, CD and AD of a parallelogram ABCD, show that $ar(EFGH) = \frac{1}{2} ar(ABCD)$.



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4. P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD show that $ar(\Delta APB) = ar\Delta(BQC)$



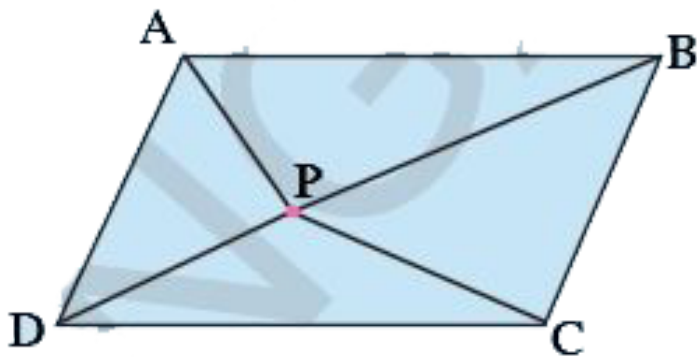
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5. P is a point in the interior of a parallelogram ABCD. Show that

(i) $ar(\triangle APB) + ar(\triangle PCD) = \frac{1}{2}ar(ABCD)$

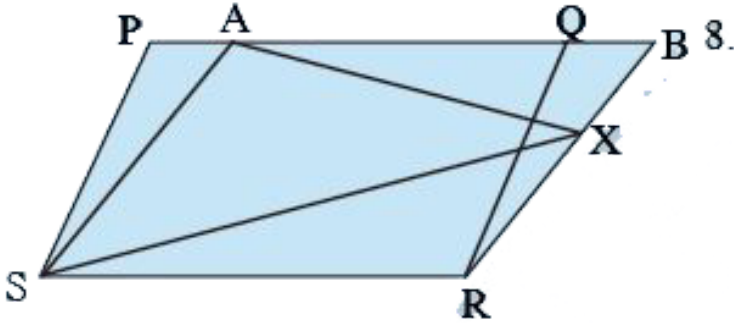
(ii) $ar(\triangle APD) + ar(\triangle PBC) = ar(\triangle APB) + ar(\triangle PCD)$

(Hint : Through , P draw a line parallel to AB)



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6. Prove that the area of a trapezium is half the sum of the parallel sides multiplied by the distance between them.



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7. PQRS and ABRS are parallelograms and X is any point on the side BR.

Show that

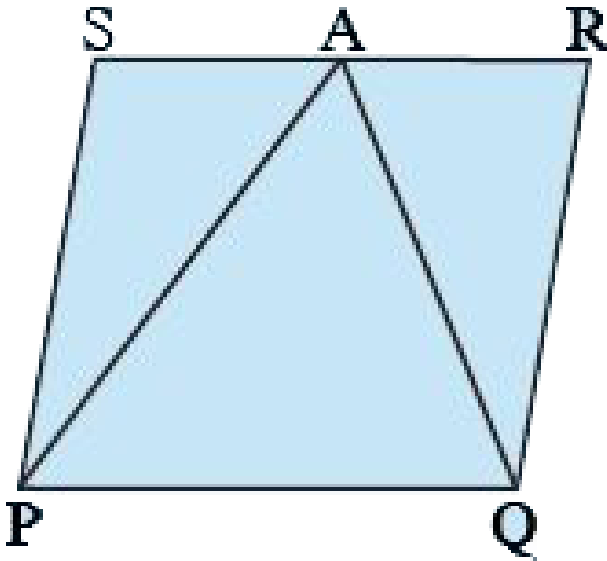
(i) $ar(PQRS) = ar(ABRS)$

(ii) $ar(\triangle AXS) = \frac{1}{2}ar(PQRS)$

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8. A farmer has a field in the form of a parallelogram PQRS as shown in the figure. He took the mid-point A on RS and joined it to points P and Q. In how many parts of field is divided? What are the shapes of these parts?

The farmer wants to sow groundnuts which are equal to the sum of pulses and paddy. How should he sow? State reasons?



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9. Prove that the area of a rhombus is equal to half of the product of the diagonals.

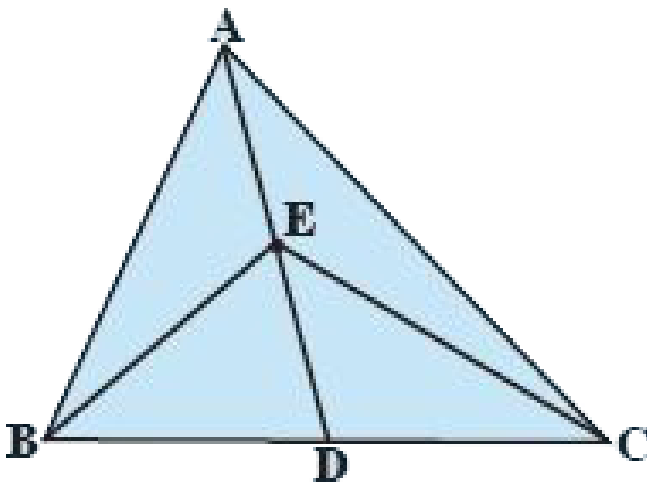
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Exercise 11 3

1. In a triangle ABC (see figure), E is the midpoint of median AD , show that

(i) $ar \Delta ABE = ar \Delta ACE$

(ii) $ar \Delta ABE = \frac{1}{4} ar(\Delta ABC)$





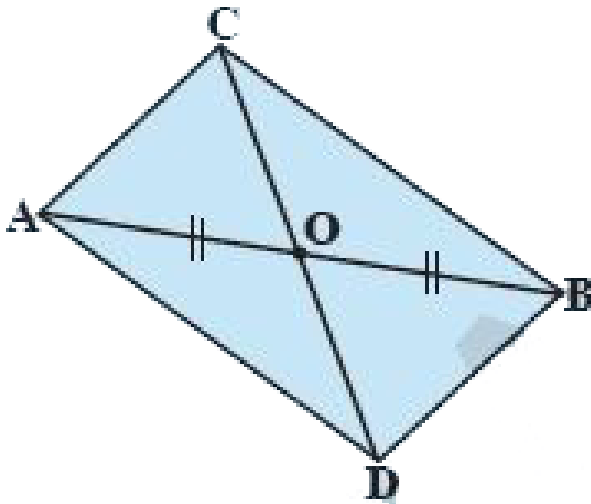
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2. Show that the diagonals of a parallelogram divide it into four triangles of equal area.



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3. In the figure, $\triangle ABC$ and $\triangle ABD$ are two triangles on the same base AB . If line segment CD is bisected by \overline{AB} at O , show that $ar(\triangle ABC) = ar(\triangle ABD)$.



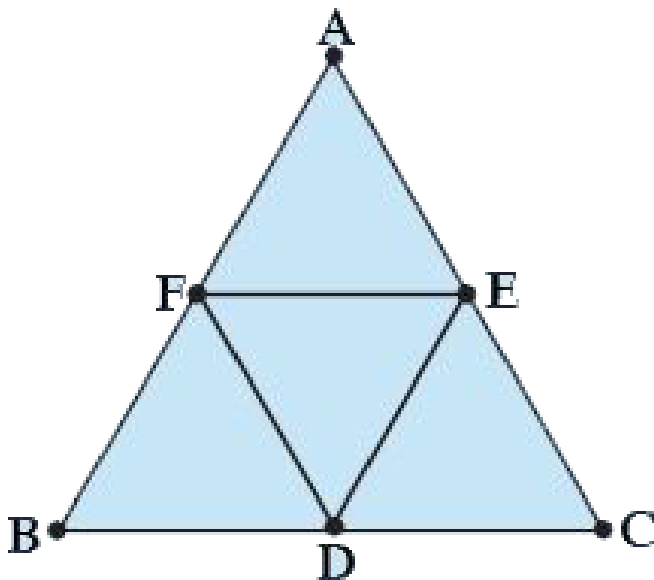
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4. In the figure, $\triangle ABC$, D, E, F are the midpoints of sides BC, CA and AB respectively. Show that

(i) BDEF is a parallelogram

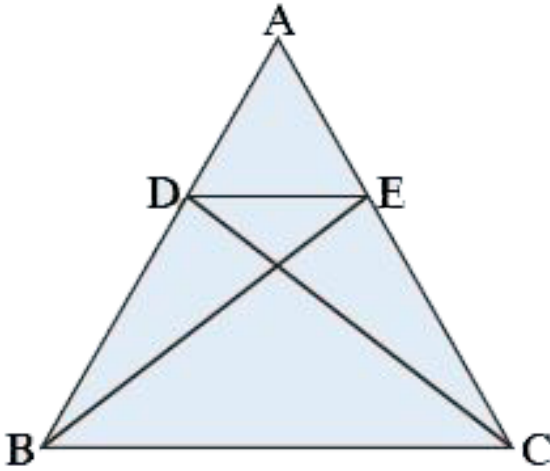
(ii) $ar(\triangle DEF) = \frac{1}{4}ar(\triangle ABC)$

(iii) $ar(BDEF) = \frac{1}{2}ar(\triangle ABC)$



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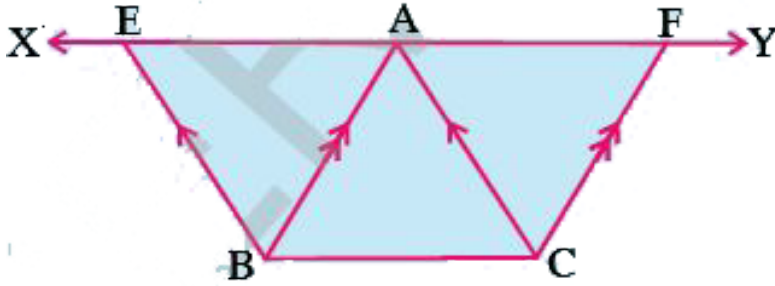
5. In the figure D, E are points on the sides AB and AC respectively of $\triangle ABC$ such that $ar(\triangle DBC) = ar(\triangle EBC)$. Prove that $DE \parallel BC$.



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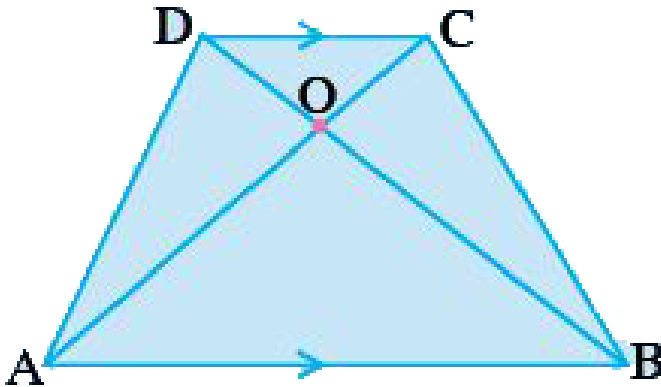
6. In the figure, XY is a line parallel to BC is drawn through A. If $BE \parallel CA$ and $CF \parallel BA$ are drawn to meet XY at E and F respectively. Show that

$$ar(\triangle ABE) = ar(\triangle ACF).$$



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7. In the figure, diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at O. Prove that $ar(\triangle AOD) = ar(\triangle BOC)$.

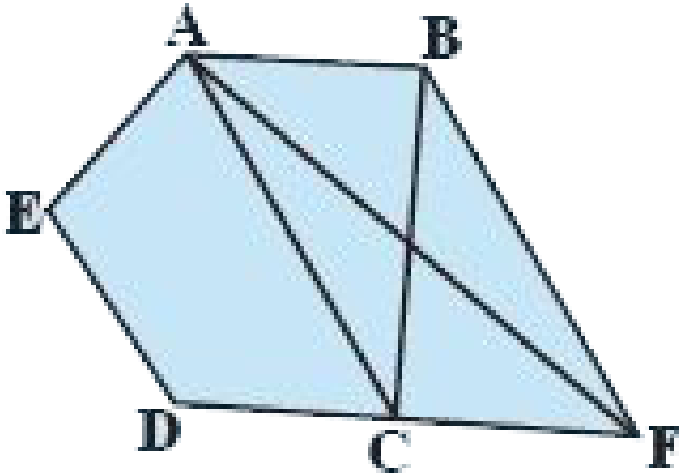


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8. In the figure, $ABCDE$ is a pentagon. A line through B parallel to AC meets DC produced at F . Show that

(i) $ar(\triangle ACB) = ar(\triangle ACF)$

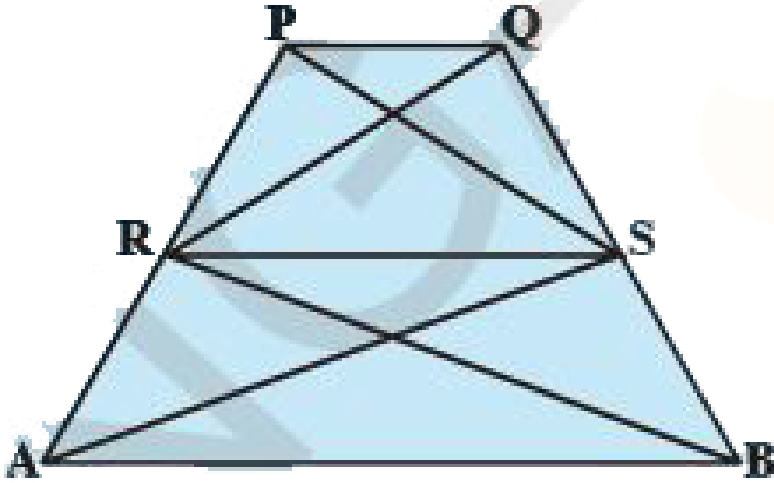
(ii) $ar(AEDF) = ar(ABCDE)$



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9. In the figure, if $ar \triangle RAS = ar \triangle RBS$ and $[ar(\triangle QRB) = ar(\triangle PAS)]$ then show that

both the quadrilaterals PQSR and RSBA are trapeziums.



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