



MATHS

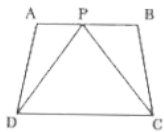
BOOKS - CAMBRIDGE MATHS

(KANNADA ENGLISH)

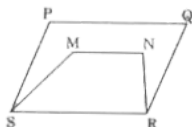
AREAS OF PARALLELOGRAMS AND TRIANGLES

Exercise 11 1

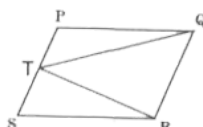
1. Which of the following lie on the same base and between the same parallels. In such a case, write common base and the two parallels.



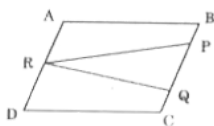
(i)



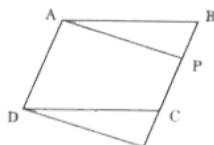
(ii)



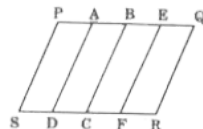
(iii)



(iv)



(v)



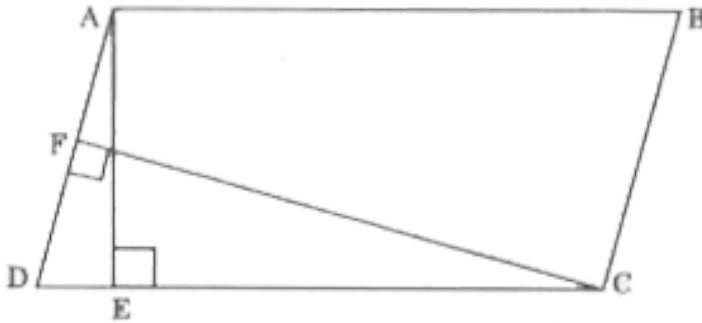
(vi)



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Exercise 11 2

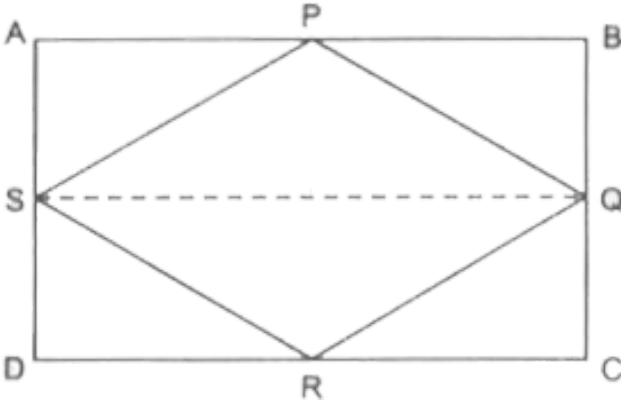
1. In the given figure, ABCD is a parallelogram ,
 $AE \perp DC$ and $CF \perp AD$. If $AB = 16$ cm, $AE = 8$ cm and $CF = 10$ cm, find AD.



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2. IF P,Q,R and S are respectively the mid-points of the sides of a parallelogram ABCD show are

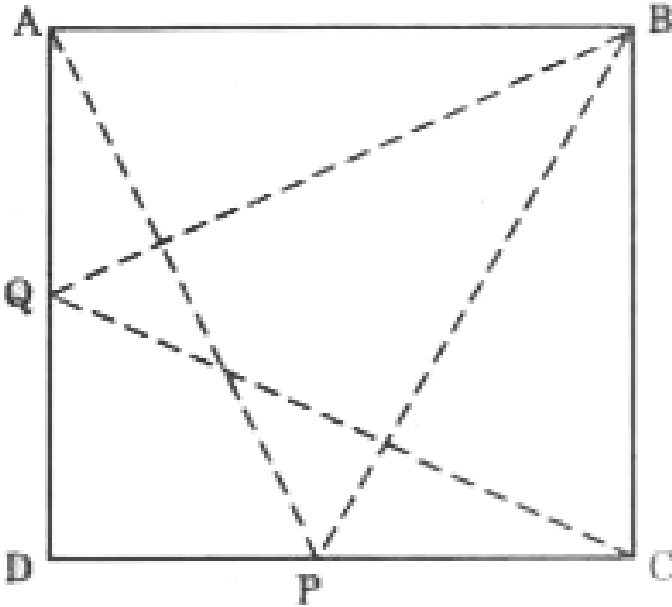
$$\text{ar}(PQRS) = \frac{1}{2} \text{ar}(ABCD)$$



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3. P and Q are any two points lying on the sides DC and AD respectively of a parallelogram, ABCD. Show that $\text{ar}(APB) = \text{ar}(CQS)$

(BQC)



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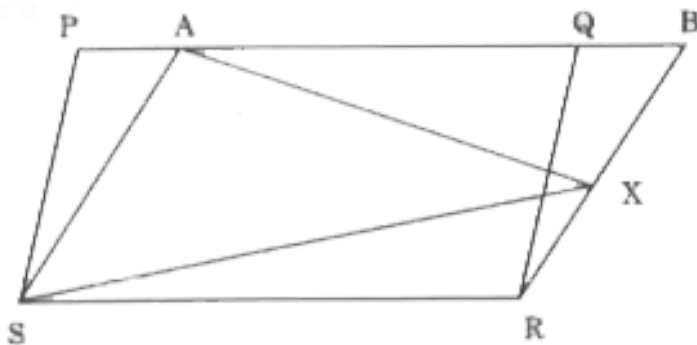
4. IN the figure, P is a point in the interior of a parallelogram ABCD. Show that

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

$$(ii) \text{ ar} (\text{APD}) + \text{ ar}(\text{PBC}) = \text{ ar}(\text{APB}) + \text{ ar} (\text{PCD})$$

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5. IN given figure, PQRS and ABRS are parallelograms and X is any point



$$(i) \text{ ar} (\text{PQRS}) = \text{ ar} (\text{ABRS})$$

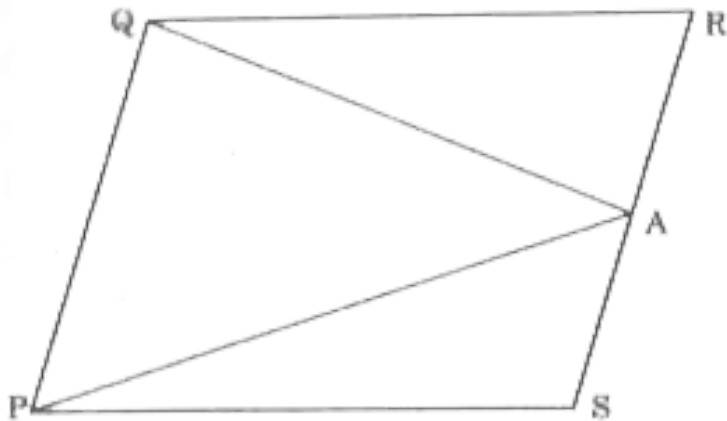
$$(ii) \text{ ar} (\text{AXS}) = \frac{1}{2} \text{ ar} (\text{PQRS})$$



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6. A farmer was having a field in the form of a parallelogram PQRS . She took any point A on RS and joined it to the points P and Q. In how many parts the field is divided ? What are the shapes of these parts ? The farmer wants to sow wheat and pulses in equal portions of the

filed separately, How should she do it ?



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Exercise 11 3

1. In the Given figure, E is any point on median AD of a $\triangle ABC$ Show that $\text{ar} (ABE) = \text{ar} (ACE)$



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2. In a triangle ABC, E is the mid - point of median AD. Show that $\text{ar}(\text{BED}) = \frac{1}{4} \text{ar}(\text{ABC})$



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



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



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5. D,E and F are respectively the mid-points of the sides BC, CA and AB of $\triangle ABC$ show that

(i) BDEF is a parallelogram.

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

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



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6. In the given figure, diagonals AC and BD of quadrilateral ABCD intersect at O such that $OB = OD$. If $AB = CD$, then show that :

(i) $\text{ar}(\text{DOC}) = \text{ar}(\text{AOB})$

(ii) $\text{ar}(\text{DCB}) = \text{ar}(\text{ACB})$

(iii) $DA \parallel CB$ or ABCD is a parallelogram .



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7. D and E are points on sides AB and AC respectively of $\triangle ABC$ such that $\text{ar}(\triangle DBC) = \text{ar}(\triangle EBC)$. Prove that $DE \parallel BC$



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8. XY is a line parallel to side BC of a triangle ABC. If BF \parallel AC and CF \parallel AB meet XY at E and F respectively, show that $\text{ar}(\triangle ABE) = \text{ar}(\triangle ACF)$



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9. The side AB of a parallelogram ABCD is produced to any point P. A line through A and parallel to CP meets CB produced at Q and then parallelogram PBQR is completed . Show that $\text{ar}(\text{ABCD}) = \text{ar}(\text{PBQR})$



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10. Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at O. Prove that $\text{ar}(\text{AOD}) = \text{ar}(\text{BOC})$.



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

(i) $\text{ar}(\triangle ACB) = \text{ar}(\triangle ACF)$

(ii) $\text{ar}(\text{AEDF}) = \text{ar}(\text{ABCDE})$



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12. A villager Itwaari has a plot of land of the shape of a quadrilateral. The Gram Panchayat

of the village decided to take over some portion of his plot from one of the corners to construct a Health Centre. Itwari agrees to the above proposal with the condition that he should be given equal amount of land in lieu of his land adjoining his plot so as form a triangular plot. Explain how this proposal will be implemented.



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13. ABCD is a trapezium with $AB \parallel DC$. A line parallel to AC intersects AB at X and BC at Y.

Prove that $\text{ar}(\text{ADX}) = \text{ar}(\text{ACY})$



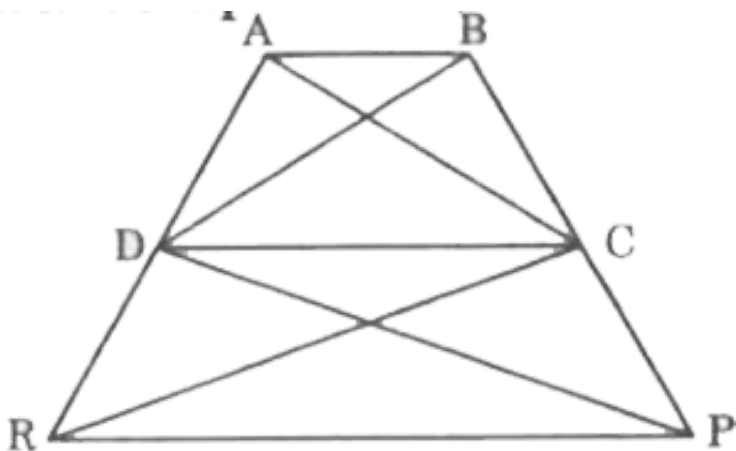
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14. Diagonals AC and BD of a quadrilateral ABCD intersect at O in such a way that $\text{ar}(\text{AOD}) = \text{ar}(\text{BOC})$. Prove that ABCD is a trapezium.



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15. In the given figure, $\text{ar}(\text{DRC}) = \text{ar}(\text{DPC})$ and $\text{ar}(\text{BDP}) = \text{ar}(\text{ARC})$. Show that both the quadrilaterals ABCD and DCPR are trapeziums.



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1. Parallelogram ABCD and rectangle ABEF are on the base AB and have equal areas. Show that the perimeter of the parallelogram is greater than that of the rectangle.



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2. In the following Figure, D and E are two points on BC such that $BD = DE = EC$. Show that $\text{ar}(\triangle ABD) = \text{ar}(\triangle ADE) = \text{ar}(\triangle AEC)$

can you now answer the equation that you left

in the "Introduction " of the capther, whether the filed of Budhia has been actually divided into three parts of equal area ?



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3. In the following figure, ABCD, DCFR and ABFE are parallelograms. Show that $\text{ar}(\text{ADE}) = \text{ar}(\text{BCF})$



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4. In the following figure, ABCD is a parallelogram and BC is produced to a point Q such that $AD = CQ$. AQ intersects DC at P. Show that $\text{ar}(\triangle BPC) = \text{ar}(\triangle DPQ)$



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5. In the following figure, ABC and BDE are two equilateral triangles such that D is the midpoint of BC. If AE intersects BC at F, show

that

$$(i) \text{ ar (BDE) = } \frac{1}{4} \text{ ar (ABC)}$$

$$(ii) \text{ ar (BDE) = } \frac{1}{2} \text{ ar (BAE)}$$

$$(iii) \text{ ar (ABC) = 2 ar (BEC)}$$

$$(iv) \text{ ar (BFE) = ar (AFD)}$$

$$(v) \text{ ar (BFE) = 2 ar (FED)}$$

$$(vi) \text{ ar (FED) = } \frac{1}{8} \text{ ar(AFC)}$$



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6. Diagonals AC and BD of a quadrilateral ABCD each other at P. Show that $\text{ar (APB)} \times \text{ar (CPD)}$

$$(\text{CPD}) = \text{ar}(\text{APD}) \times \text{ar}(\text{BPC})$$



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7. P and Q are respectively the mid-points of sides AB and BC of a triangle ABC and R is the mid point at AP, show that

$$(i) \text{ar}(\text{PQR}) = \frac{1}{2} \text{ar}(\text{ARC})$$

$$(ii) \text{ar}(\text{RQC}) = \frac{3}{8} \text{ar}(\text{ABC})$$

$$(iii) \text{ar}(\text{PBQ}) = \text{ar}(\text{ARC})$$



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8. In the following figure , ABC is a right triangle right angled at A. BCED ACFG and ABMN and squares on the sides BC, CA and AB respectively , Line segment AX \perp DE meets BC at Y. Show that

$$(i) \text{ ar } \triangle MBC = \text{ ar } (\triangle MBC)$$

$$(ii) \text{ ar } (BXYD) = 2 \text{ ar } (\triangle MBC)$$

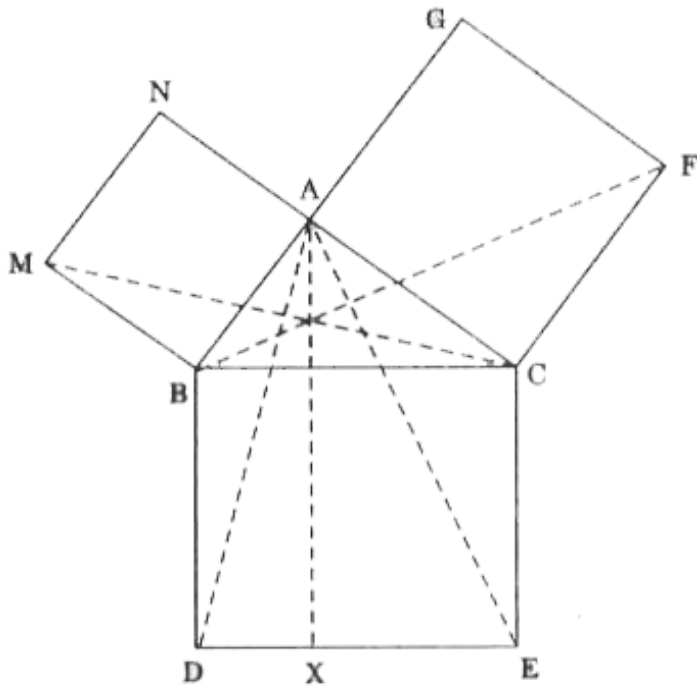
$$(iii) \text{ ar } (BYXD) = \text{ ar}(ABMN)$$

$$(iv) \text{ ar } \triangle FCB = \text{ ar } \triangle ACE$$

$$(v) \text{ ar } (CYXE) = 2 \text{ ar } (\triangle FCB)$$

$$(vi) \text{ ar } (CYXE) = \text{ ar } (ACFG)$$

(vii) $\text{ar}(\text{BCED}) = \text{ar}(\text{ABMN}) + \text{ar}(\text{ACFG})$



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