MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

AREAS

Example

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

Prove that (i) ar (ABCD) = ar(ABEF)

(ii) ar (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 ar $(\triangle ABC) = \dfrac{1}{2}$ ar(|| 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 , AP || BQ || CR. Prove that ar $(\triangle AQC)$ = ar $(\triangle PBR)$.

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

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2. Rajni says 1 sq.m = 100^2 sq.cm. Do you agree? Explain.

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3. Which of the following figures lie on the same base and between the same parallels?

In such a cases, write the common base and the two parallels.

Exercise 11 1

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

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

(Hint: PQRS has two parts)

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

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

Exercise 11 2

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

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4. What type of quadrilateral do you get, if you join $\triangle APM$, $\triangle DPO$, $\triangle OCN$ and $\triangle MNB$ in the example 3.

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

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

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

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

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

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

8. PQRS and ABRS are parallelograms and X is any point on the side BR. Show that

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

(ii) $ar(\Delta AXS) = \dfrac{1}{2} ar(PQRS)$

9. 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?

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

Exercise 11 3

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

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

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

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

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

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4. In the figure D, E are points on the sides AB and AC respectively of ΔABC such that $ar(\Delta DBC) = ar(\Delta EBC)$. Prove that DE ∥ BC.

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5. In the figure, XY is a line parallel to BC is drawn through A. If BE || CA and CF || BA are drawn to meet XY at E and F respectively. Show that $ar(\Delta ABE) = ar(\Delta ACF)$.

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

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

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

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

8. 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.

9. A villager Ramayya has a plot of land in the shape of a quadrilateral. The grampanchayat of the village decided to take over some portion of his plot from one of the corners to construct a school. Ramayya agrees to the above proposal with the condition that he should be given equal amount of land in exchange of his land adjoining his plot so as to form a triangular plot. Explain how this proposal will be implemented. (Draw a rough sketch of plot).