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# MATHS

# BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

# AREAS OF PARALLELOGRAMS AND TRIANGLES

Exercise 92

**1.** In parallelogam ABCD,  $AM \perp CD$  and  $AN \perp BC$ . If AM=8 cm, AB=12 cm and AD=16 cm, find AN.



2. 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).



**3.** P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD show that





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# Exercise 93

**1.** In a triangle ABC , E is the midpoint of median AD. Show that  $ar(BED) = \frac{1}{4}ar(ABC)$ 



**2.** Show that four points (1, -2), (3, 6), (5, 10) and

(3, 2) are the vertices of a parallelogram.

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**3.** In the given figure , ABCD is a parallelogram and BC is produced to a point Q such that AD=CQ. If AQ intersect DC at P, show that

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ar(BPC)=ar(DPQ).
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5. XY is a line parallel to side BC of a triangle ABC. If BE||AC and CF ||AB meet XY at E and F respectively, show that ar(ABE)=ar(ACF)





6. Diagonals AC and BD of a quadrilateral ABCD

intersect each other at P. Show that ar (APB) x

ar(CPD)=ar(APD) x ar(BPC)







7. In the given figure, ABCD is a trapezium with AB||DC. E is a point on extended BC. Prove that ar (BDE) = ar (ACED).





8. In the given figure, ABED is a parallelogram

and DE and EC . Prove that ar (ABF)=ar(BEC)





10. In the given figure , ABCD , DCFE and ABFE

are parallelograms . Show that





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1. Answer the following by a number or a word

or a sentence :

If the area of a square is same as the area of a

circle, find the ratio of the perimeter of the

square and that of the circle.





ar(ADE)=ar(BCF).



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**3.** In the given figure, ABED is a parallelogram and DE and EC . Prove that ar (ABF)=ar(BEC)





segment BO. Prove that (1) ar(ADO)=ar(CDO)

(2)ar(ABP)=ar(CBP)



# Sum To Enrich Remember

# 1. In the given figure, ABED is a parallelogram

and DE and EC . Prove that ar (ABF)=ar(BEC)





2. If a triangle and a parallelogram are on the same base and between the same parallels, then prove that the area of the triangle is equal to half the area of the parallelogram.

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3. Show that a median of a triangle divides it

into two triangles of equal areas.

**4.** In the following figure AC = 10&BD = 14,

then area of quadrilateral ABCD-



**Skill Testing Exercise** 

**1.** In a triangle ABC , E is the midpoint of median AD. Show that  $ar(BED) = \frac{1}{4}ar(ABC)$ 





2. 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)



**3.** In  $\triangle ABC$ , AD is a median . E is the midpoint of AD and F is the midpoint of AE. Prove that ar(ABF)= $\frac{1}{8}$ ar(ABC).

**4.** ABCD is a parallelogram in which P and Q are midpoints of opposite sides AB and CD (see the given figure). If AQ intersects DP at S and BQ intersects CP at R. Show that:



APCQ is a parallelogram.

**5.** In parallelogram ABCD, AB=8 cm. The lengths of altitudes corresponding to AB and AD are 4 cm and 5 cm respectively. Find the length of AD.

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**6.** In parallelogram PQRS. RS=12 cm . The lengths of altitudes corresponding to PQ and QR are 6 cm and 9 cm respectively. Find the length of PS.





7. Prove that the area of a rhombus is equal to

half of the product of the diagonals.



8. prove that the line segment joining the midpoints of two opposite sides of a parallelogram divides the parallelogram into two parallelograms with equal area.

**9.** In quadrilateral ABCD, AM and CN are altitudes on diagonal BD drawn from A and C respectively .Prove that  $ar(ABCD) = \frac{1}{2} BD(AM+CN)$ 

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10. In the given figure, ABED is a parallelogram

and DE and EC . Prove that ar (ABF)=ar(BEC)







# 11. In riangle ABC, point D lies on side BC. E is the

midpoint of AD. Prove that,

 $ar(EBC) = \frac{1}{2}ar(ABC)$ 

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# 12. In riangle ABC, point D lies on side BC. E is the

midpoint of AD. Prove that,

$$ar(EBC) = \frac{1}{2}ar(ABC)$$



# **Multiple Choice Questions Mcqs**

- **1.** Area of a parallelogram =\_\_\_\_
  - A.  $\frac{1}{2}$  x base x corresponding altitude
  - B.  $\frac{1}{2}$  x the product the diagonals
  - C. base x corresponding altitude
  - D.  $\frac{1}{2}$  x the product of adjacent sides

## Answer: A::B::C::D







- A. base x corresponding altitude
- B. base + corresponding altitude

C. 
$$\frac{1}{2}$$
 x base x corresponding altitude

D. 2 x base x corresponding altitude

### Answer: A::B::C::D



**3.** ABCD is a rectangle . If AB=10 cm and ar(ABCD)=150  $cm^2$ , then BC=\_\_\_ cm.

A. 7.5

B. 15

C. 30

D. 12

Answer: A

**4.** ABCD is a square . If ar(ABCD)=36  $cm^2$  . Then

## AB=\_\_\_ cm.

A. 18

B. 9

C. 6

D. 12

#### Answer:



5. In  $\triangle ABC$ , BC=10 cm and the length of altitude AD is 5 cm. Then , ar(ABC)=....  $cm^2$ .

A. 50

B. 100

C. 25

D. 15

**Answer: B** 

6. In riangle ABC, AD is an altitude . If BC=8 cm and ar (ABC)=40  $cm^2$ , then AD= \_\_\_\_ cm. A. 5 B.10 C. 15 D. 20 Answer: A Watch Video Solution

7. In riangle PQR , PM is an altitude and QR is the hypotenuse. If QR=12 cm and PM=6 cm, then ar(PQR)= $\__cm^2$ 

A. 18

B. 72

C. 36

D. 24

### Answer: C



**8.** In riangle XYZ, XZ is the hypotenuse. If XY = 8

cm and YZ=12 cm, then ar(XYZ)=  $\_\_$   $cm^2$ 

A. 20

B.40

C. 96

D. 48

Answer: D

**9.** In parallelogram ABCD, AM is an altitude corresponding to base BC. If BC =8 cm and AM=6 cm, then ar(ABCD)= $\__cm^2$ 

A. 48

B. 24

C. 12

D. 96

Answer: D

**10.** In parallelogram PQRS, QR=10 cm and ar(PQRS)=120  $cm^2$ . Then the length of altitude PM corresponding to base QR is \_\_\_\_ cm.

- A. 6
- B. 12
- C. 18
- D. 24

# Answer: A::B



**11.** For parallelogram ABCD, ar(ABCD)=48  $cm^2$  .

Then ar(ABC)= $\_cm^2$ 

A. 96

B.48

C. 24

D. 12

Answer: B::D

12. ABCD is a rhombus . If AC=6cm and BD=9

cm, then ar(ABCD)=\_\_  $cm^2$ 

A. 15

B. 7.5

C. 54

D. 27

Answer: B



**13.** PQRS is a rhombus. If ar (PQRS)=40  $cm^2$  and

PR = 8 cm, then QS=\_\_cm.

A. 20

B. 10

C. 25

D. 40

Answer: A

14. In  $riangle PQR, riangle Q = 90^{\circ}$ , PQ=5 cm and PR=13 cm. Then ar(PQR)= $\_$   $cm^2$ A. 15 B. 30 C.45 D. 60 Answer: C Watch Video Solution

**15.** In  $\triangle ABC$ , P,Q and R are the midpoints of AB, BC and CA respectively. If ar(ABC)=32  $cm^2$ , then ar(PQR)= $\__cm^2$ 

A. 128

B. 16

C. 8

D. 64

#### Answer:



**16.** In  $\triangle ABC$ , P, Q and R are the midpoints of AB, BC and CA respectively . If ar(ABC)=\_\_\_40  $cm^2$ , then ar(PBCR)=\_\_ $cm^2$ 

A. 10

B. 20

C. 30

D. 40

### Answer: C



17. In  $\triangle ABC$ , P, Q and R are the midpoints of AB, BC and CA respectively . If ar(PBQR)=36  $cm^2$ , then ar(ABC)= $\_cm^2$ 

A. 18

B. 36

C. 54

D. 72

#### **Answer: B**

