

CHAPTER - 9WORKSHEETCLASS - IXAREAS OF PARALLELOGRAM AND TRIANGLES

Q1. The diagonals of a ||gm ABCD intersect at O. A line through O meets AB in X and CD in Y. Show that $\text{ar}(\text{||gm AEFD}) = \text{ar}(\text{||gm EBCF})$.

Q2. Triangles ABC and DBC are on the same base BC with A, D on opposite sides of line BC, such that $\text{ar}(\triangle ABC) = \text{ar}(\triangle DBC)$. Show that BC bisects AD.

Q3. If the medians of a $\triangle ABC$ intersect at G, show that $\text{ar}(\triangle AGB) = \text{ar}(\triangle AGC) = \text{ar}(\triangle BGC) = \frac{1}{3} \text{ar}(\triangle ABC)$.

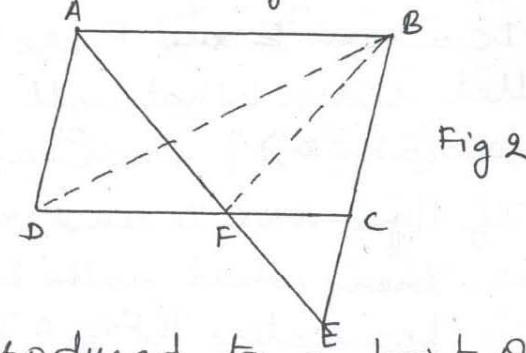
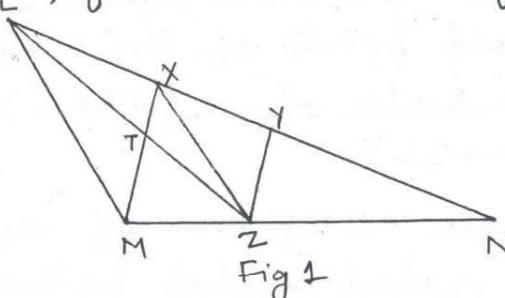
Q4. In $\triangle ABC$, D is the mid point of AB. P is any point on BC. CQ \parallel PD meets AB in Q. Show that $\text{ar}(\triangle BPQ) = \frac{1}{2} \text{ar}(\triangle ABC)$.

Q5. Let ABCD be a ||gm of area 124 cm^2 . If E and F are the mid points of sides AB and CD resp., then find the area of ||gm AEFD.

Q6. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Then prove that $\text{ar}(\triangle BDE) = \frac{1}{4} \text{ar}(\triangle ABC)$.

Q7. X and Y are points on the side LN of $\triangle LMN$ such that $LX = XY = YN$. Through X, a line is drawn parallel to LM to meet MN at Z. Prove that $\text{ar}(\triangle LZY) = \text{ar}(\triangle MZY)$. (Fig 1)

Q8. ABCD is a ||gm in which BC is produced to E such that $CE = BC$. AE intersects CD at F. If $\text{ar}(\triangle BDF) = 3 \text{ cm}^2$, find the area of ||gm ABCD. (Fig 2).



Q9. ABCD is a ||gm and BC is produced to a point Q such that $BC = CQ$. If AQ intersects DC at P. Show that $\text{ar}(\triangle BPC) = \text{ar}(\triangle DPC)$. (Fig 3)

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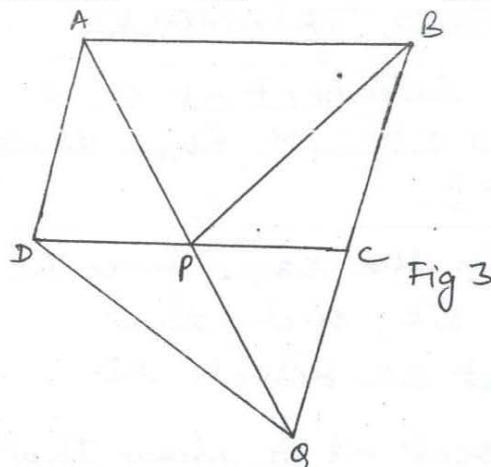


Fig 3

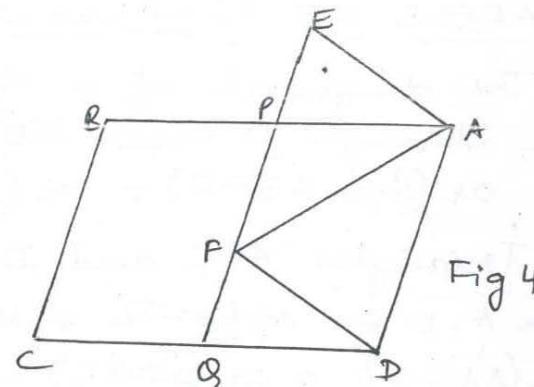


Fig 4

Q11. X and Y are the mid points of AC and AB resp, $QP \parallel BC$ and CYQ and BXP are straight lines. Prove that $\text{ar}(\triangle ABP) = \text{ar}(\triangle ACQ)$. (Fig 5)

Q12. ABCDE is any pentagon. BP drawn parallel to AC meets DC produced at P and EQ drawn parallel to AD meets CD produced at Q. Prove that

$$\text{ar}(ABCDE) = \text{ar}(APQ).$$

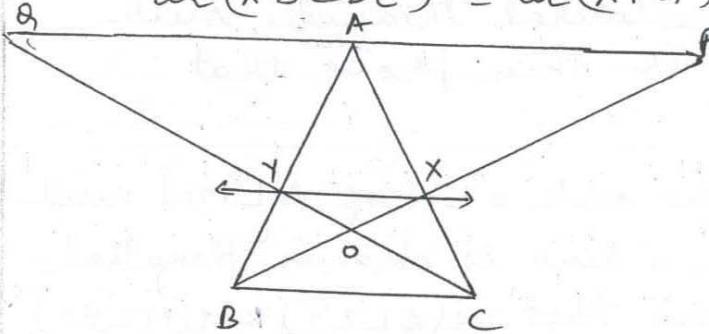


Fig 5

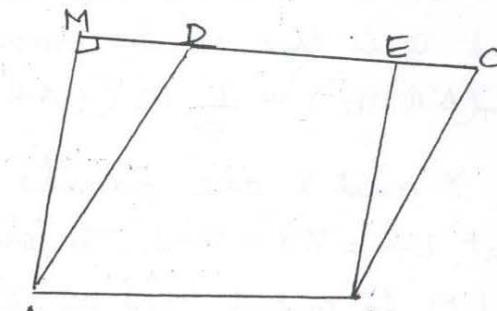


Fig 6

Q13. Two llgms are on equal bases and between the same parallels. What will be the ratio of their areas?

Q14. ABCD is a trapezium with parallel sides $AB=a\text{ cm}$ and $DC=b\text{ cm}$. E and F are the mid points of the non-parallel sides. What will be the ratio of $\text{ar}(ABFE)$ and $\text{ar}(EFC)$? Ans: $(3a+b):(a+3b)$

Q15. If llgm ABCD and rectangle ABEF are of equal areas, then what will be the relationship between their perimeters? (Fig 6) Ans: $\text{Peri}(ABCD) > \text{Peri}(ABEF)$

Q16. PQRS is a square. T and U are resp the mid points of PS and QR. Find $\text{ar}(\triangle OTS)$, if $PQ=8\text{ cm}$.

where O is the point of intersection of TU and QS.

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Q17. ABCD is a square. E and F are resp. the mid-points of BC and CD. If R is the mid point of EF prove that $\text{ar}(\text{AER}) = \text{ar}(\text{AFR})$. (Fig 7)

Q18. O is any point on the diagonal PR of a ||gm PQRS. Prove that $\text{ar}(\text{PSO}) = \text{ar}(\text{PQO})$.

Q19. $BD \parallel CA$, E is mid-point of CA and $BD = \frac{1}{2} CA$.
Prove that $\text{ar}(\text{ABC}) = 2 \text{ar}(\text{DBC})$. (Fig 8)

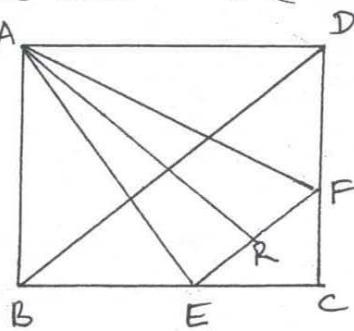


Fig 7

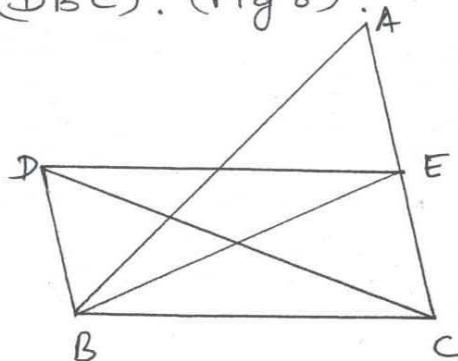


Fig 8

Q20. A point E is taken on the side BC of a ||gm ABCD. AE and DC are produced to meet at F. Prove that $\text{ar}(\text{ADF}) = \text{ar}(\text{ABFC})$.