

CHAPTER - 9
TRIANGLES

EXERCISE - 9.4

1. A point **E** is taken on the side **BC** of a parallelogram **ABCD**. **AE** and **DC** are produced to meet at **F**. Prove that $\text{ar}(\triangle ADF) = \text{ar}(\triangle ABFC)$.
2. The diagonals of a parallelogram **ABCD** intersect at a point **O**. Through **O**, a line is drawn to intersect **AD** at **P** and **BC** at **Q**. Show that **PQ** divides the parallelogram into two parts of equal area.
3. The medians **BE** and **CF** of a triangle **ABC** intersect at **G**. Prove that the area of $\triangle GBC = \text{area of the quadrilateral AFGE}$.
4. In Fig.1, $CD \parallel AE$ and $CY \parallel BA$. Prove that $\text{ar}(\triangle CBX) = \text{ar}(\triangle AXY)$

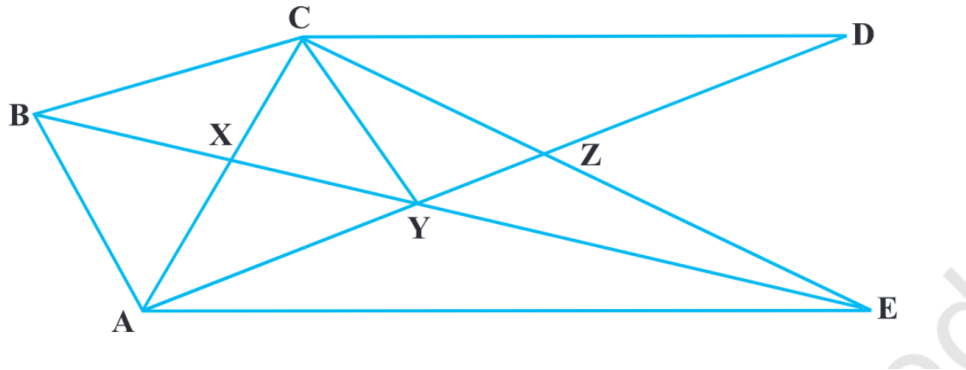


Figure 1

5. **ABCD** is a trapezium in which $AB \parallel DC$, $DC = 30$ cm and $AB = 50$ cm. If **X** and **Y** are, respectively the mid-points of **AD** and **BC**, prove that $\text{ar}(\triangle DCYX) = \frac{7}{9} \text{ar}(\triangle XYBA)$.
6. In $\triangle ABC$, if **L** and **M** are the points on **AB** and **AC**, respectively such that $LM \parallel BC$. Prove that $\text{ar}(\triangle LOB) = \text{ar}(\triangle MOC)$.

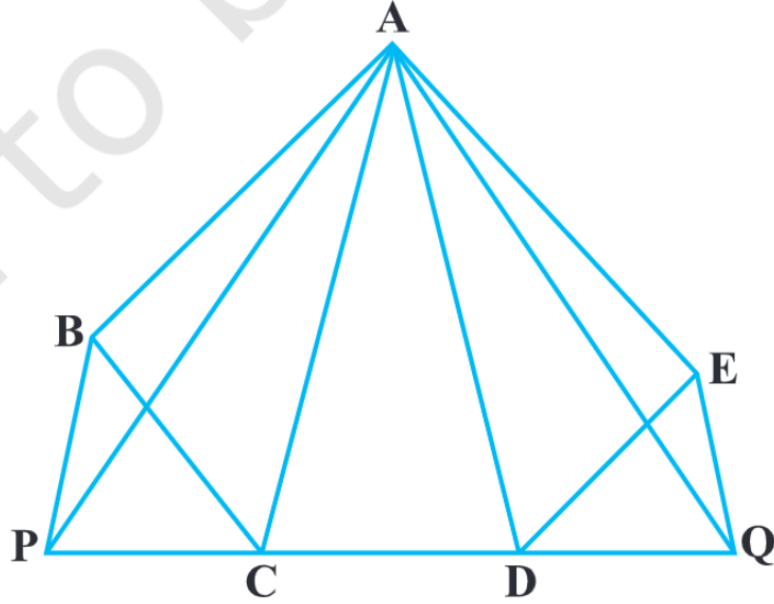


Figure 2

7. In Fig.2, 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 $\text{ar}(\text{ABCDE}) = \text{ar}(\text{APQ})$.
8. If the medians of a $\triangle ABC$ intersect at **G**, show that

$$\text{ar}(\text{AGB}) = \text{ar}(\text{AGC}) = \text{ar}(\text{BGC}) = \frac{1}{3}\text{ar}(\text{ABC}). \quad (1)$$

9. In Fig.3, **X** and **Y** are the mid-points of AC and AB respectively, QP \parallel BC and CYQ and BXP are straight lines. Prove that $\text{ar}(\text{ABP}) = \text{ar}(\text{ACQ})$.

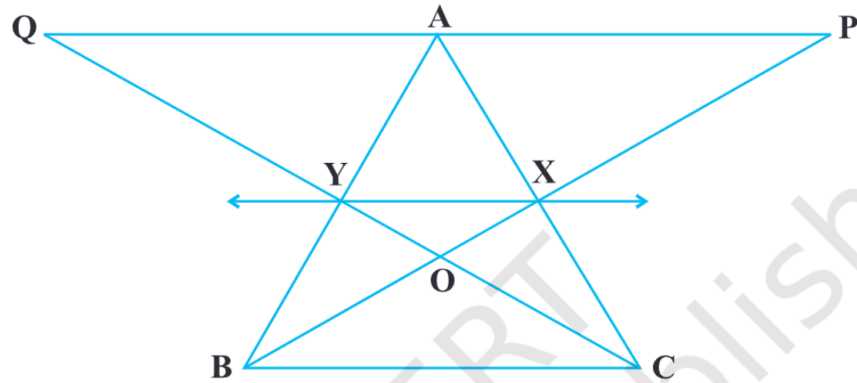


Figure 3

10. In Fig.4, ABCD and AEFD are two parallelograms. Prove that $\text{ar}(\text{PEA}) = \text{ar}(\text{QFD})$ [Hint: Join PD].

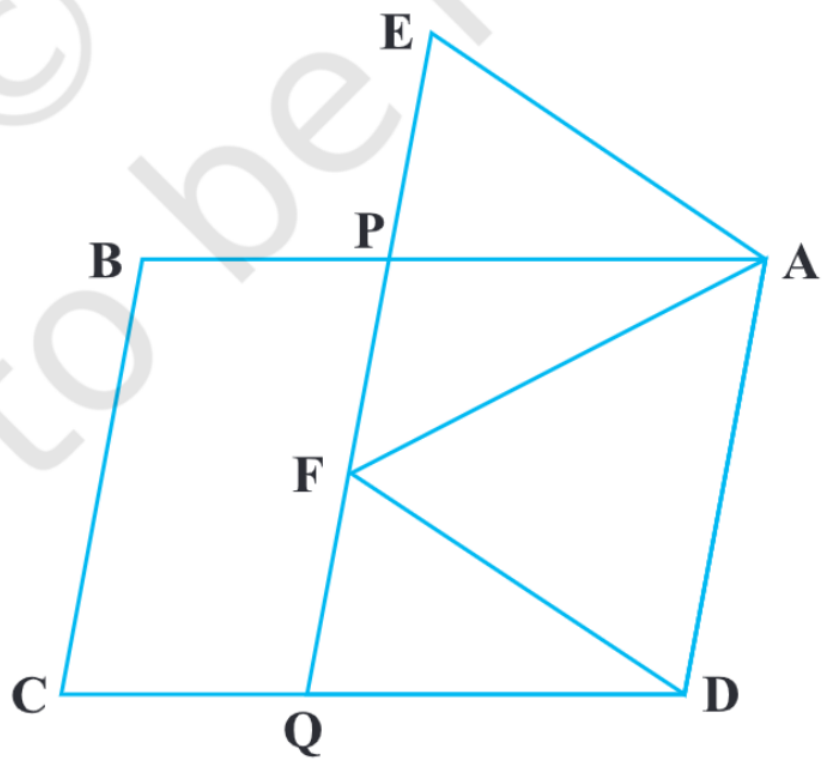


Figure 4