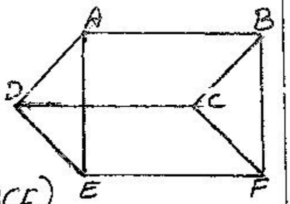
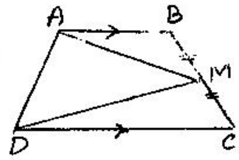
Work Sheet - 9 - Areas of Parallelograms and Triangles. Class. IX

1. In the fig. ABCD, DCFE & ABFE are parallelograms. Show that ar.($\triangle ADE$) = ar.($\triangle BCF$)

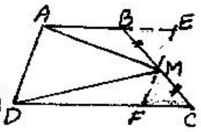


[Hint: prove $\triangle ADE \cong \triangle BCF$, by SSS rule]

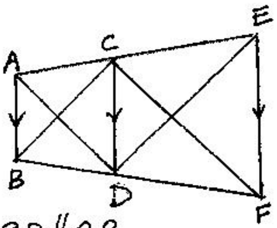
2. In the fig. ABCD is a trapezium with AB ∥ DC. M is the midpoint of BC. Prove that ar.($\triangle AMD$) = $\frac{1}{2}$ ar(trap. ABCD)



[Hint: Const: Through M draw EMF ∥ AD so that AEFD is a ∥gm.
prove $\triangle BME \cong \triangle CMF$ (by AAS rule)
prove ar.(trap. ABCD) = ar.(∥gm AEFD)
but ar.($\triangle AMD$) = $\frac{1}{2}$ ar.(∥gm AEFD)]

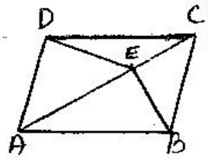


3. In the fig. ABFE is a trapezium with AB ∥ EF. C & F are points on the sides AE & BF such that CD ∥ AB. Prove that ar($\triangle ADE$) = ar($\triangle BCF$)

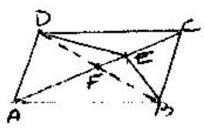


[Hint: prove ar($\triangle CDA$) = ar($\triangle CDB$) — ①
ar (CDE) = ar($\triangle CDF$) — ②
adding ① & ②.]

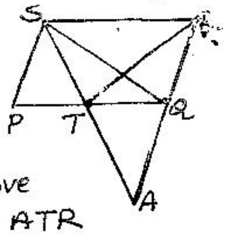
4. In the fig. E is any point on the diagonal AC of ∥gm ABCD. Prove that ar($\triangle ABE$) = ar($\triangle ADE$)



[Hint: In $\triangle ABD$, AF is the median ⇒ ar($\triangle ABF$) = ar($\triangle ADF$) ①
again, In $\triangle BED$, EF is the median ⇒ ar($\triangle BEF$) = ar($\triangle DEF$) — ②
adding ① & ②]

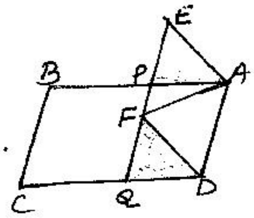


5) A point T is taken on the side PQ of ∥gm PQRS such that ST and RQ produced to meet at A. Prove that $\triangle ASQ$ and $\triangle ATR$ are equal in area.



[Hint: prove ar($\triangle TQS$) = ar($\triangle TQR$)
add ar($\triangle TQA$) on both sides]

6. In the fig. ABCD and AEFD are two parallelograms. prove that ar($\triangle PEA$) = ar($\triangle QFD$)



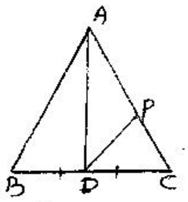
[Hint: prove. ar(∥gm ADFE) = ar(∥gm ADQP)
Sub. ar(ADFP) from both sides]

7. MCQ

i) The median of a triangle divides the triangle into two
[A) congruent $\triangle$les B) isosceles $\triangle$les
C) right $\triangle$les D) $\triangle$les of equal areas]

ii) If a triangle and a ∥gm are on the same base and between the same ∥els then the ratio of the area of the $\triangle$le to the area of the ∥gm is
[A) 1 : 4 B) 1 : 2 C) 2 : 1 D) 1 : 3]

iii) AD is the median of $\triangle ABC$ and F is a point of AC such that ar($\triangle ADP$) : ar(ABD) = 2 : 3 then ar($\triangle PDC$) : ar($\triangle ABC$) is



[A) 2 : 5 B) 1 : 5 C) 1 : 6 D) 3 : 5]

MCQ (Answers)

i) D ii) B iii) C