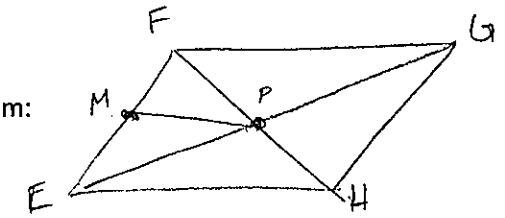
Geometry Honors
5-3 Proofs

Name Key

1. EFGH is a parallelogram whose diagonals intersect at P. M is the midpoint of $\overline{EF}$. Prove that $MP = \frac{1}{2}EH$.

Given: $\square EFGH$
M is mdpt. of $\overline{EF}$

Diagram:

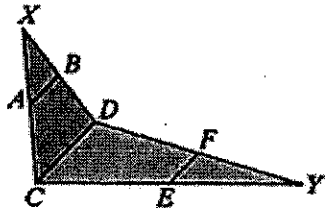


Prove: $MP = \frac{1}{2}EH$

1. $\square EFGH$; M is mdpt. of $\overline{EF}$	1. Given
2. $\overline{EG}$ bisects $\overline{FH}$	2. diag. of $\square$ bis. each other
3. P is mdpt. of $\overline{FH}$	3. def. bisect
4. $MP = \frac{1}{2}EH$	4. segment joins mdpts. of 2 sides of $\triangle = \frac{1}{2}$ 3rd side

2. Given: Points A, B, E, F are the midpoints of $\overline{XC}, \overline{XD}, \overline{YC}$ and $\overline{YD}$.

Prove: AB = EF

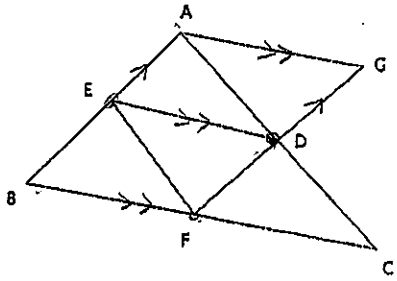


1. A, B, E, F are mdpts. of $\overline{XC}, \overline{XD}, \overline{YC}, \overline{YD}$	1. Given
2. $AB = \frac{1}{2}DC$; $EF = \frac{1}{2}DC$	2. Seg. joins mdpt. of 2 sides → $\frac{1}{2}$ Leng 3rd
3. $AB = EF$	3. subst.

3. Given: ABFG is a parallelogram; D is the midpoint of $\overline{AC}$.

* $\overline{DE} \parallel \overline{BC}$ → MISSING

Prove: DF = AE



1. ABFG is ▱; D is mdpt. of $\overline{AC}$	1. Given
$\overline{DE} \parallel \overline{BC}$	
2. $\overline{AB} \parallel \overline{GF}$	2. def. ▱
3. E is mdpt. of $\overline{AB}$; F is mdpt. of $\overline{BC}$	3. segm. through mdpt. of 1 side
	// to another side → through mdpt
	of 3rd side.
4. $DF = \frac{1}{2} AB$	4. Segm. betwn. mdpts. of 2 sides
	$= \frac{1}{2}$ Length of 3rd side
5. $AE = \frac{1}{2} AB$	5. mdpt. Thm.
6. $DF = AE$	6. Subst.