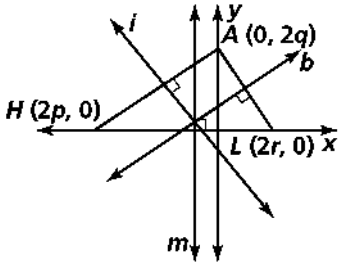
Name _____ Class _____ Date _____

Practice 6-7

Proofs Using Coordinate Geometry



1. Given $\triangle HAL$ with perpendicular bisectors *i, b,* and *m,* complete the following to show that *i, b,* and *m* intersect in a point.

a. The slope of $\overline{HA}$ is $\frac{-q}{p}$. What is the slope of line *i*?

b. The midpoint of HA is (p, q). Show that the equation of line *i* is $y = \frac{p}{q}x + q - \frac{p^2}{q}$.

c. The midpoint of $\overline{HL}$ is $(r + p, 0)$. What is the equation of line *m*?

d. Show that lines *i* and *m* intersect at $(r + p, \frac{rp}{q} + q)$.

e. The slope of $\overline{AL}$ is $\frac{-q}{r}$. What is the slope of line *b*?

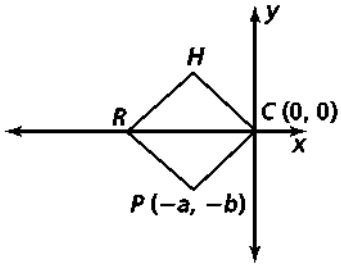
f. What is the midpoint of $\overline{AL}$?

g. Show that the equation of line *b* is $y = \frac{r}{q}x + q - \frac{r^2}{q}$.

h. Show that lines *b* and *m* intersect at $(r + p, \frac{rp}{q} + q)$.

i. Give the coordinates for the point of intersection of *i, b,* and *m.*

Complete Exercises 2 and 3 without using any new variables.



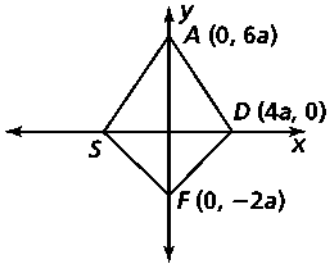
2. *RHCP* is a rhombus.

a. Determine the coordinates of *R.*

b. Determine the coordinates of *H.*

c. Find the midpoint of $\overline{RH}$.

d. Find the slope of $\overline{RH}$.



3. *ADFS* is a kite.

a. Determine the coordinates of *S.*

b. Find the midpoint of $\overline{AS}$.

c. Find the slope of $\overline{AS}$.

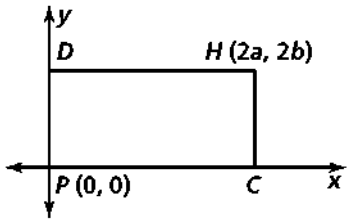
d. Find the midpoint of $\overline{DF}$.

e. Find the slope of $\overline{DF}$.

4. Complete the coordinates for rectangle *DHCP*. Then use coordinate geometry to prove the following statement: The diagonals of a rectangle are congruent (Theorem 6-11).

Given: rectangle *DHCP*

Prove: $\overline{DC} \cong \overline{HP}$



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