Problem-Based Task: Stained Glass Pattern, Part II

Coaching Sample Responses

a. Identify the two rhombuses in the new pattern.

One rhombus is $\square KLDM$ and the second rhombus is $\square KMHJ$.

b. In general, what are the properties of the sides of rhombuses?

All sides of a rhombus are congruent.

c. In general, what are the properties of the angles of rhombuses?

Opposite angles of a rhombus are congruent.

d. What segment is shown to be the diagonal of $\square KLDM$?

$\overline{KD}$ is the diagonal of $\square KLDM$.

e. The diagonal of a rhombus bisects opposite angles. Which angles are bisected by $\overline{KD}$?

$\overline{KD}$ bisects $\angle LDM$ and $\angle MKL$.

f. Name the angles created by $\overline{KD}$ and determine if they are congruent to one another.

The angles created by $\overline{KD}$ are $\angle LDK$, $\angle MDK$, $\angle LKD$, and $\angle MKD$.

$\angle LDK \cong \angle MDK \cong \angle LKD \cong \angle MKD$

Opposite angles of the rhombus are congruent, and the diagonal bisects them (cuts them in half). Therefore, each angle created by $\overline{KD}$ is of the same measure. They are congruent.

g. Is it possible to determine if $\triangle DLK \cong \triangle DMK$?

Yes, there is enough information to determine that $\triangle DLK \cong \triangle DMK$.

$\overline{KL} \cong \overline{LD} \cong \overline{DM} \cong \overline{MK}$

$\angle LDK \cong \angle MDK \cong \angle LKD \cong \angle MKD$

$\overline{KD} \cong \overline{KD}$

It follows that $\triangle DLK \cong \triangle DMK$ because of side-angle-side (SAS) or side-side-side (SSS).

h. What segment is shown to be the diagonal of $\square KMHJ$?

$\overline{KH}$ is the diagonal of $\square KMHJ$.

i. The diagonal of a rhombus bisects opposite angles. Which angles are bisected by $\overline{KH}$?

$\overline{KH}$ bisects $\angle MHJ$ and $\angle JKM$.

j. Name the angles created by $\overline{KH}$ and determine if they are congruent to one another.

The angles created by $\overline{KH}$ are $\angle MHK$, $\angle JHK$, $\angle MKH$, and $\angle JKH$.

$\angle MHK \cong \angle JHK \cong \angle MKH \cong JKH$

Opposite angles of the rhombus are congruent, and the diagonal bisects them, or cuts them in half. Therefore, each angle created by $\overline{KH}$ is of the same measure. They are congruent.

k. Is it possible to determine if $\triangle HMK \cong \triangle HJK$?

There is enough information to determine that $\triangle HMK \cong \triangle HJK$.

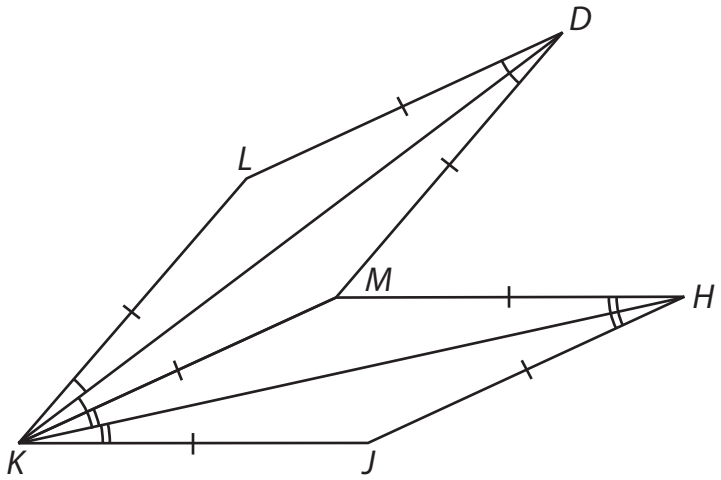
$\overline{JH} \cong \overline{HM} \cong \overline{MK} \cong \overline{KJ}$

$\angle MHK \cong \angle JHK \cong \angle MKH \cong JKH$

$\overline{KH} \cong \overline{KH}$

It follows that $\triangle HMK \cong \triangle HJK$ because of side-angle-side (SAS) or side-side-side (SSS).

l. Mark congruent sides and angles on the diagram.



m. Is it possible to determine if $\triangle DLK \cong \triangle HMK$?

It is not possible to make this determination because there is not enough information given.

The triangles only have two sets of corresponding congruent sides. It is not known whether any angles are congruent, or if the remaining two corresponding sides are congruent.

There is no congruence statement that allows us to state that the two triangles are congruent based on the given information.

n. Is it possible to determine if $\triangle DLK \cong \triangle HJK$?

It is not possible to make this determination because there is not enough information given.

The triangles only have two sets of corresponding congruent sides. It is not known whether any angles are congruent, or if the remaining two corresponding sides are congruent.

There is no congruence statement that allows us to state that the two triangles are congruent based on the given information.

o. Can Mary confidently state that all triangles are congruent without using measuring tools?

Mary cannot confidently state that all triangles are congruent without using measuring tools because not enough information is known.

Recommended Closure Activity

Select one or more of the essential questions for a class discussion or as a journal entry prompt.