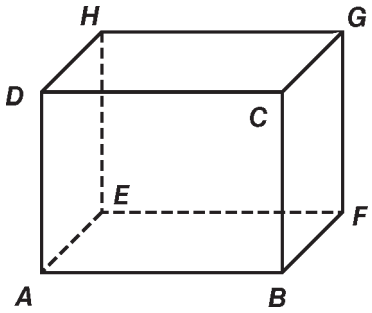
NAME _____ DATE _____ PERIOD _____

Enrich

Lines and Angles in Space

In a plane, two lines are either parallel or intersecting. In *space*, there are three possibilities: parallel, **intersecting**, or **skew**. Imagine holding two yardsticks in the air and that the lines created by the sticks extend forever in both directions. You could hold the sticks so that the lines meet or do not meet. If the lines ever meet, they are intersecting. If they do not intersect, they are either parallel or skew. If they are oriented in the same direction, they are parallel. If lines do not intersect and are not parallel, they are skew.

Imagine that the figure to the right is a cubic room with a floor, ceiling, and four walls. Each corner is labeled with a letter for reference. The line segments that form the edges of the room are each contained in a line.



$\overleftrightarrow{AB}$ and $\overleftrightarrow{HG}$ are parallel. Lines *AB* and *HG* can be written as $\overleftrightarrow{AB}$ and $\overleftrightarrow{HG}$.

$\overleftrightarrow{BC}$ and $\overleftrightarrow{HG}$ are skew. Lines *BC* and *HG* can be written as $\overleftrightarrow{BC}$ and $\overleftrightarrow{HG}$.

$\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$ are intersecting. Lines *AB* and *BC* can be written as $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$.

Refer to the figure above for Exercises 1–14. Determine if the lines are *parallel, intersecting*, or *skew*.

1. $\overleftrightarrow{CD}$ and $\overleftrightarrow{AB}$

2. $\overleftrightarrow{CD}$ and $\overleftrightarrow{DH}$

3. $\overleftrightarrow{FG}$ and $\overleftrightarrow{AB}$

4. $\overleftrightarrow{EH}$ and $\overleftrightarrow{FG}$

5. $\overleftrightarrow{CD}$ and $\overleftrightarrow{EH}$

6. $\overleftrightarrow{GH}$ and $\overleftrightarrow{AD}$

7. $\overleftrightarrow{EH}$ and $\overleftrightarrow{AE}$

8. $\overleftrightarrow{CD}$ and $\overleftrightarrow{EF}$

Find the measure of each angle.

9. $\angle DAB$

10. $\angle AFB$

11. $\angle CHE$

CHALLENGE Determine if the given lines would be *parallel, intersecting*, or *skew.*

12. $\overleftrightarrow{CE}$ and $\overleftrightarrow{GA}$

13. $\overleftrightarrow{AB}$ and $\overleftrightarrow{HE}$

14. $\overleftrightarrow{FH}$ and $\overleftrightarrow{BD}$