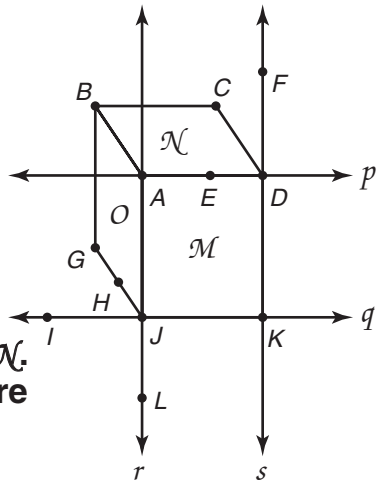
NAME _____ DATE _____ PERIOD _____

2-5 Skills Practice

Postulates and Paragraph Proofs

Explain how the figure illustrates that each statement is true. Then state the postulate that can be used to show each statement is true.



1. Planes O and $\mathcal{M}$ intersect in line r.

The two planes meet at the edge which lies on line *r*. Postulate: If two planes intersect, then their intersection is a line.

2. Line p lies in plane $\mathcal{N}$.

The points *A* and *D* both lie on line *p* and in plane $\mathcal{N}$. Postulate: If two points lie in a plane, then the entire line containing those points lies in that plane.

Determine whether each statement is *always*, *sometimes*, or *never* true. Explain your reasoning.

3. Three collinear points determine a plane.

Never; 3 noncollinear points determine a plane.

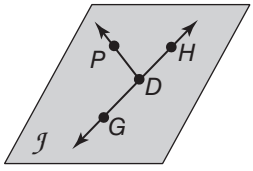
4. Two points A and B determine a line.

Always; through any two points there is exactly one line.

5. A plane contains at least three lines.

Always; a plane contains at least three points not on the same line, and each pair of these determines a line.

In the figure, $\overleftrightarrow{DG}$ and $\overleftrightarrow{DP}$ is in plane $\mathcal{J}$ and H lies on $\overleftrightarrow{DG}$. State the postulate that can be used to show each statement is true.



6. G and P are collinear.

Postulate 2.1: through any two points, there is exactly one line.

7. Points D, H, and P are coplanar.

Postulate 2.2; Through any three points not on the same line, there is exactly one plane.

8. PROOF In the figure at the right, point B is the midpoint of $\overline{AC}$ and point C is the midpoint of $\overline{BD}$. Write a paragraph proof to prove that $AB = CD$.

Given: *B* is the midpoint of $\overline{AC}$.
C is the midpoint of $\overline{BD}$.

Prove: $AB = CD$

Proof: Since *B* is the midpoint of $\overline{AC}$ and *C* is the midpoint of $\overline{BD}$, we know by the Midpoint Theorem, that $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CD}$. Since congruent segments have equal measures, $AB = BC$ and $BC = CD$. Thus, by the Transitive Property of Equality, $AB = CD$.