1-2 Practice
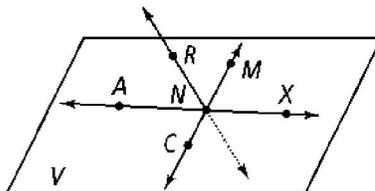
Form G

Points, Lines, and Planes

Use the figure below for Exercises 1–8. Note that $\overleftrightarrow{RN}$ pierces the plane at N. It is not coplanar with V.

1. Name two segments shown in the figure.

2. What is the intersection of $\overleftrightarrow{CM}$ and $\overleftrightarrow{RN}$?

3. Name three collinear points.

4. What are two other ways to name plane V?

5. Are points $R, N, M,$ and X coplanar?

6. Name two rays shown in the figure.

7. Name the pair of opposite rays with endpoint N.

8. How many lines are shown in the drawing?

For Exercises 9–14, determine whether each statement is *always, sometimes,* or *never* true.

9. $\overrightarrow{GH}$ and $\overrightarrow{HG}$ are the same ray.

10. $\overrightarrow{JI}$ and $\overrightarrow{JL}$ are opposite rays.

11. A plane contains only three points.

12. Three noncollinear points are contained in only one plane.

13. If $\overleftrightarrow{EG}$ lies in plane X, point G lies in plane X.

14. If three points are coplanar, they are collinear.

15. Reasoning Is it possible for one ray to be shorter in length than another? Explain.

16. Open-Ended Draw a figure of two planes that intersect in $\overleftrightarrow{ST}$.

1-2 Practice (continued) Form G

Points, Lines, and Planes

17. Draw a figure to fit each description.

a. Through any two points there is exactly one line.

b. Two distinct lines can intersect in only one point.

18. Reasoning Point F lies on $\overrightarrow{EG}$ and point M lies on $\overrightarrow{EN}$. If F, E, and M are collinear, what must be true of these rays?
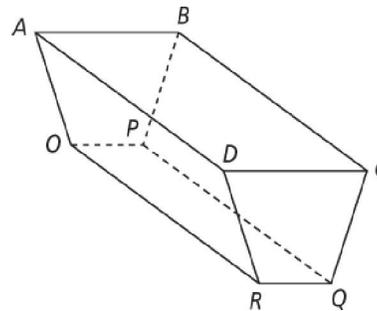
19. Writing What other terms or phrases mean the same as *postulate?*

20. How many segments can be named from the figure at the right?
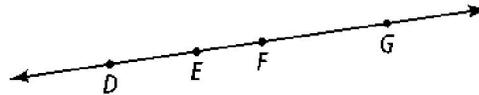
Use the figure at the right for Exercises 21–29.
Name the intersection of each pair of planes or lines.

21. planes ABP and BCD

22. $\overleftrightarrow{RQ}$ and $\overleftrightarrow{RO}$

23. planes ADR and DCQ

24. planes BCD and BCQ

25. $\overleftrightarrow{OP}$ and $\overleftrightarrow{QP}$

Name two planes that intersect in the given line.

26. $\overleftrightarrow{RO}$ **27.** $\overleftrightarrow{CQ}$ **28.** $\overleftrightarrow{DA}$ **29.** $\overleftrightarrow{BP}$

Coordinate Geometry Graph the points and state whether they are collinear.

30. $(0, 0)$, $(4, 2)$, $(6, 3)$

31. $(0, 0)$, $(6, 0)$, $(9, 0)$

32. $(-1, 1)$, $(2, -2)$, $(4, -3)$

33. $(1, 2)$, $(2, 3)$, $(4, 5)$

34. $(-2, 0)$, $(0, 4)$, $(2, 0)$

35. $(-4, -1)$, $(-1, -2)$, $(2, -3)$

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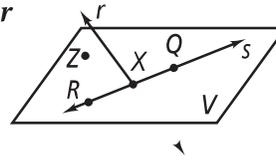# 1-2 Practice   *Form K*

Points, Lines, and Planes

Use the figure at the right for Exercises 1–4. Note that line *r* pierces the plane at *X*. It is not coplanar with *V*.

1. What are two other ways to name $\overleftrightarrow{QX}$?

   To start, remember you can name a line by any __?__ point(s) on the line or by __?__ lowercase letter(s). **two; one**

   Two other ways to name $\overleftrightarrow{QX}$ are line __?__ and __?__.
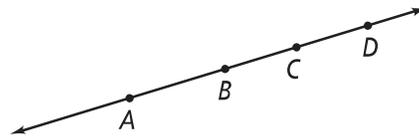   **s; Answers may vary. Sample:** $\overleftrightarrow{XQ}$

2. What are two other ways to name plane *V*?
   Answers may vary. Sample: *XQZ; RZQ*

3. Name three collinear points. **R, X, and Q**

4. Name four coplanar points. **Z, R, X, and Q**

Use the figure at the right for Exercises 5–7.

5. Name six segments in the figure. To start, remember that a segment is part of a line that consists of __?__ endpoints. **two**

   Six segments are $\overline{AB}$, $\overline{BC}$, __?__, __?__, __?__, and __?__. **$\overline{CD}$; $\overline{AC}$; $\overline{AD}$; $\overline{BD}$**

6. Name the rays in the figure. **Answers may vary. Samples:** $\overrightarrow{AB}$ or $\overrightarrow{AC}$ or $\overrightarrow{AD}$; $\overrightarrow{BC}$ or $\overrightarrow{BD}$; $\overrightarrow{CD}$; $\overrightarrow{DC}$ or $\overrightarrow{DB}$ or $\overrightarrow{DA}$; $\overrightarrow{CB}$ or $\overrightarrow{CA}$; $\overrightarrow{BA}$

7. **a.** Name the pairs of opposite rays with endpoint *C*.
   Answers may vary. Samples: $\overrightarrow{CD}$ and $\overrightarrow{CA}$ or $\overrightarrow{CB}$
   b. Name another pair of opposite rays.
   Answers may vary. Samples: $\overrightarrow{BA}$ and $\overrightarrow{BD}$ or $\overrightarrow{BC}$

For Exercises 8–12, determine whether each statement is *always*, *sometimes*, or *never* true.

8. Plane *ABC* and plane *DEF* are the same plane. **sometimes**

9. $\overleftrightarrow{DE}$ and $\overleftrightarrow{DF}$ are the same line. **sometimes**

10. Plane *XYZ* does not contain point *Z*. **never**

11. All the points of a line are coplanar. **always**

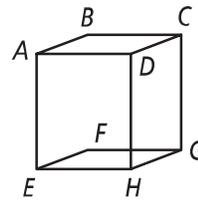12. Two rays that share an endpoint form a line. **sometimes**

1-2 Practice (continued)   Form K
Points, Lines, and Planes

Use the figure at the right for Exercises 13–21.

Name the intersection of each pair of planes. To start, identify the points that both planes contain.

13. planes *DCG* and *EFG* $\overleftrightarrow{GH}$

14. planes *EFG* and *ADH* $\overleftrightarrow{EH}$
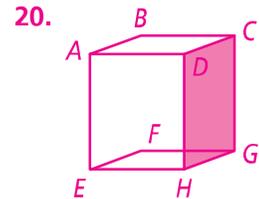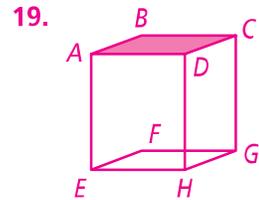
15. planes *BCG* and *ABF* $\overleftrightarrow{BF}$

Name two planes that intersect in the given line. To start, identify the planes that contain the given line.

16. $\overleftrightarrow{CD}$ **ABC and DCG**

17. $\overleftrightarrow{DH}$ **DHG and DHE**

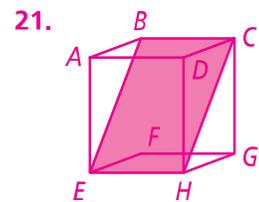**18.** $\overleftrightarrow{EF}$ **EFG and EFB**

Copy the figure. Shade the plane that contains the given points.

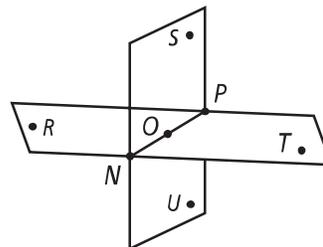**19.** *A, B, C*   **20.** *C, D, H*   **21.** *E, H, B*

Postulate 1-4 states that any three noncollinear points lie in one plane. Find the plane that contains the first three points listed. Then determine whether the fourth point is in that plane. Write *coplanar* or *noncoplanar* to describe the points.

22. *P, T, R, N*   **coplanar**

23. *P, O, S, N*   **coplanar**

24. *T, R, N, U*   **noncoplanar**

25. *P, O, R, S*   **noncoplanar**

Use the diagram at the right. How many planes contain each line and point?

26. $\overleftrightarrow{KL}$ and *G*   **1**

27. $\overleftrightarrow{HM}$ and *F*   **1**

28. $\overleftrightarrow{JI}$ and *G*   **1**

29. $\overleftrightarrow{NM}$ and *M*   **infinitely many**