

Vocabulary and Core Concept Check

- WRITING** Compare collinear points and coplanar points.
- WHICH ONE DOESN'T BELONG?** Which term does *not* belong with the other three? Explain your reasoning.

\overline{AB}

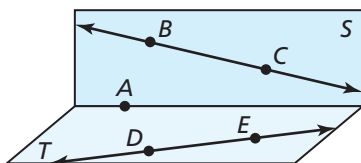
plane CDE

\overleftrightarrow{FG}

\overrightarrow{HI}

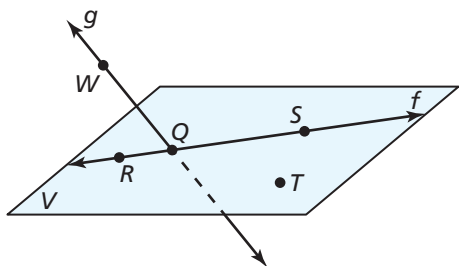
Monitoring Progress and Modeling with Mathematics

In Exercises 3–6, use the diagram.



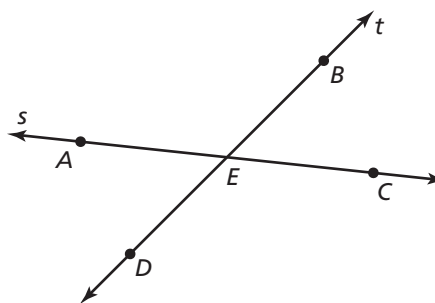
- Name four points.
- Name two lines.
- Name the plane that contains points A , B , and C .
- Name the plane that contains points A , D , and E .

In Exercises 7–10, use the diagram. (See Example 1.)



- Give two other names for \overleftrightarrow{WQ} .
- Give another name for plane V .
- Name three points that are collinear. Then name a fourth point that is not collinear with these three points.
- Name a point that is not coplanar with R , S , and T .

In Exercises 11–16, use the diagram. (See Example 2.)

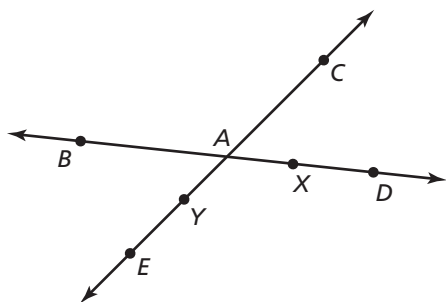



- What is another name for \overline{BD} ?
- What is another name for \overline{AC} ?
- What is another name for ray \overrightarrow{AE} ?
- Name all rays with endpoint E .
- Name two pairs of opposite rays.
- Name one pair of rays that are not opposite rays.


In Exercises 17–24, sketch the figure described. (See Examples 3 and 4.)

- plane P and line ℓ intersecting at one point
- plane K and line m intersecting at all points on line m
- \overleftrightarrow{AB} and \overleftrightarrow{AC}
- \overleftrightarrow{MN} and \overleftrightarrow{NX}
- plane M and \overleftrightarrow{NB} intersecting at B
- plane M and \overleftrightarrow{NB} intersecting at A
- plane A and plane B not intersecting
- plane C and plane D intersecting at \overleftrightarrow{XY}

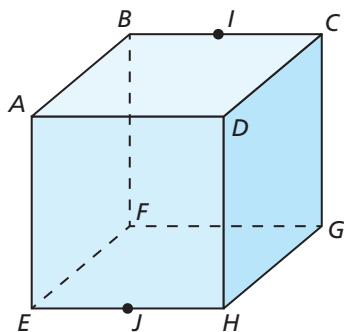
ERROR ANALYSIS In Exercises 25 and 26, describe and correct the error in naming opposite rays in the diagram.



25.  \overrightarrow{AD} and \overrightarrow{AC} are opposite rays.

26.  \overline{YC} and \overline{YE} are opposite rays.

In Exercises 27–34, use the diagram.



27. Name a point that is collinear with points E and H .
28. Name a point that is collinear with points B and I .
29. Name a point that is not collinear with points E and H .
30. Name a point that is not collinear with points B and I .
31. Name a point that is coplanar with points D , A , and B .
32. Name a point that is coplanar with points C , G , and F .
33. Name the intersection of plane AEH and plane FBE .
34. Name the intersection of plane BGF and plane HDG .

In Exercises 35–38, name the geometric term modeled by the object.

35.



36.



37.

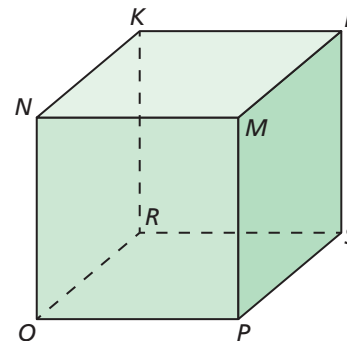


38.



In Exercises 39–44, use the diagram to name all the points that are not coplanar with the given points.

39. N , K , and L
40. P , Q , and N
41. P , Q , and R
42. R , K , and N
43. P , S , and K
44. Q , K , and L



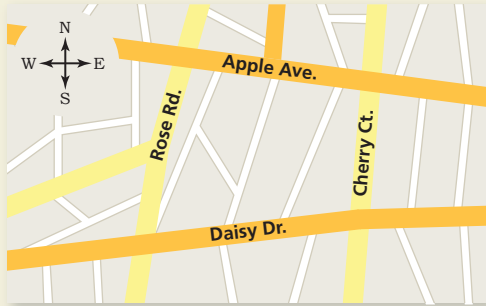
45. **CRITICAL THINKING** Given two points on a line and a third point not on the line, is it possible to draw a plane that includes the line and the third point? Explain your reasoning.
46. **CRITICAL THINKING** Is it possible for one point to be in two different planes? Explain your reasoning.

47. **REASONING** Explain why a four-legged chair may rock from side to side even if the floor is level. Would a three-legged chair on the same level floor rock from side to side? Why or why not?

48. **THOUGHT PROVOKING** You are designing the living room of an apartment. Counting the floor, walls, and ceiling, you want the design to contain at least eight different planes. Draw a diagram of your design. Label each plane in your design.

49. **LOOKING FOR STRUCTURE** Two coplanar intersecting lines will always intersect at one point. What is the greatest number of intersection points that exist if you draw four coplanar lines? Explain.

50. **HOW DO YOU SEE IT?** You and your friend walk in opposite directions, forming opposite rays. You were originally on the corner of Apple Avenue and Cherry Court.



- Name two possibilities of the road and direction you and your friend may have traveled.
- Your friend claims he went north on Cherry Court, and you went east on Apple Avenue. Make an argument as to why you know this could not have happened.

MATHEMATICAL CONNECTIONS In Exercises 51–54, graph the inequality on a number line. Tell whether the graph is a *segment*, a *ray* or *rays*, a *point*, or a *line*.

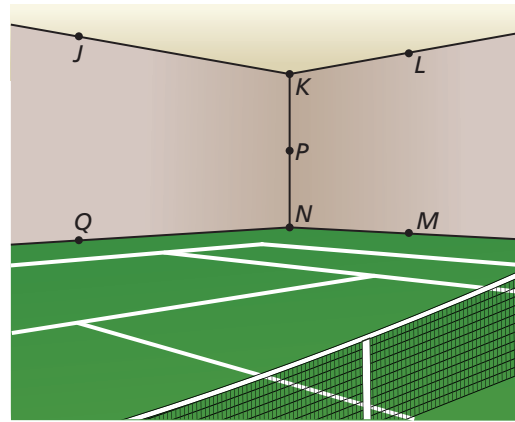
51. $x \leq 3$

52. $-7 \leq x \leq 4$

53. $x \geq 5$ or $x \leq -2$

54. $|x| \leq 0$

55. **MODELING WITH MATHEMATICS** Use the diagram.



- Name two points that are collinear with P .
- Name two planes that contain J .
- Name all the points that are in more than one plane.

CRITICAL THINKING In Exercises 56–63, complete the statement with *always*, *sometimes*, or *never*. Explain your reasoning.

- A line _____ has endpoints.
- A line and a point _____ intersect.
- A plane and a point _____ intersect.
- Two planes _____ intersect in a line.
- Two points _____ determine a line.
- Any three points _____ determine a plane.
- Any three points not on the same line _____ determine a plane.
- Two lines that are not parallel _____ intersect.
- ABSTRACT REASONING** Is it possible for three planes to never intersect? intersect in one line? intersect in one point? Sketch the possible situations.

Maintaining Mathematical Proficiency

Reviewing what you learned in previous grades and lessons

Find the absolute value. (*Skills Review Handbook*)

65. $|6 + 2|$

66. $|3 - 9|$

67. $|-8 - 2|$

68. $|7 - 11|$

Solve the equation. (*Skills Review Handbook*)

69. $18 + x = 43$

70. $36 + x = 20$

71. $x - 15 = 7$

72. $x - 23 = 19$