

Assignment Guide and Homework Check

ASSIGNMENT

Basic: 1, 2, 3–19 odd, 25–43 odd, 50, 55, 65–72

Average: 1, 2, 10–46 even, 50–54 even, 55, 65–72

Advanced: 1, 2, 12, 18, 24, 26, 34–54 even, 55, 56–64 even, 65–72

HOMEWORK CHECK

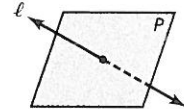
Basic: 7, 9, 15, 19, 33

Average: 10, 16, 18, 30, 40

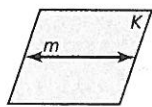
Advanced: 18, 34, 44, 54, 62

ANSWERS

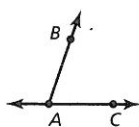
- Collinear points lie on the same line. Coplanar points lie on the same plane.
- plane CDE ; Planes have two dimensions. Lines, line segments, and rays have one dimension.
- Sample answer:* A, B, D, E
- $\overline{DE}, \overline{BC}$
- plane S
- plane T
- \overrightarrow{QW} , line g
- Sample answer:* plane RST
- R, Q, S ; *Sample answer:* T
- W
- \overline{DB}
- \overline{CA}
- \overline{AC}
- $\overrightarrow{EB}, \overrightarrow{EC}, \overrightarrow{ED}, \overrightarrow{EA}$
- \overrightarrow{EB} and \overrightarrow{ED} , \overrightarrow{EA} and \overrightarrow{EC}
- Sample answer:* \overrightarrow{EC} and \overrightarrow{ED}
- Sample answer:* ℓ



18. *Sample answer:*



19. *Sample answer:*



20. *Sample answer:*



1.1 Exercises

Dynamic Solutions available at BigIdeasMath.com

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}

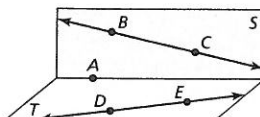
plane CDE

\overrightarrow{FG}

\overline{HI}

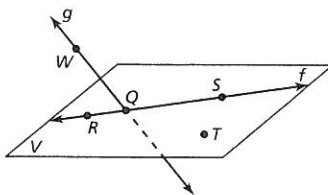
Monitoring Progress and Modeling with Mathematics

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 .

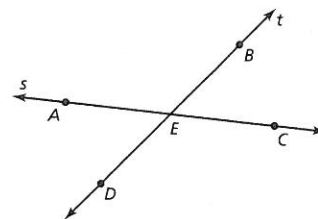
In Exercises 7–10, use the diagram. (See Example 1.)



- Give two other names for \overrightarrow{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 .

8 Chapter 1 Basics of Geometry

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

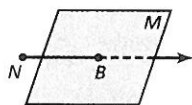


- What is another name for \overline{BD} ?
- What is another name for \overline{AC} ?
- What is another name for ray \overrightarrow{AE} ?
- Name all rays with endpoint E .
- Name two pairs of opposite rays.
- Name one pair of rays that are not opposite rays.

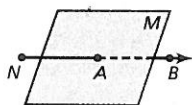
In Exercises 17–24, sketch the figure described. (See Examples 3 and 4.)

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

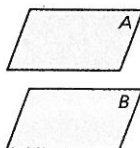
21. *Sample answer:*



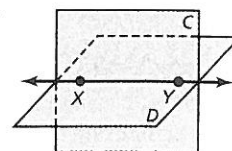
22. *Sample answer:*



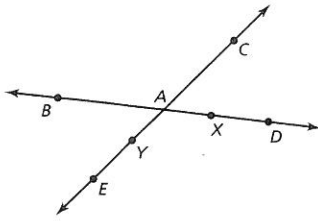
23. *Sample answer:*



24. *Sample answer:*



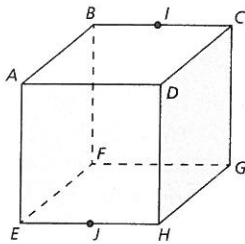
ERROR ANALYSIS In Exercises 25 and 26, describe and correct the error in naming opposite rays in the diagram.



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

26. ~~X~~ \overrightarrow{YC} and \overrightarrow{YE} are opposite rays.

In Exercises 27–34, use the diagram.



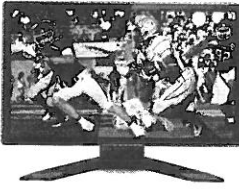
27. Name a point that is collinear with points E and H .
28. Name a point that is collinear with points B and I .
29. Name a point that is not collinear with points E and H .
30. Name a point that is not collinear with points B and I .
31. Name a point that is coplanar with points D , A , and B .
32. 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 $H DG$.

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

35.



36.



37.

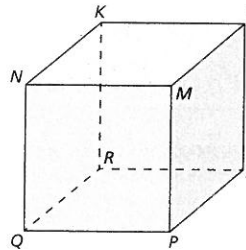


38.



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.

Section 1.1 Points, Lines, and Planes 9

Dynamic Teaching Tools

Dynamic Assessment & Progress Monitoring Tool

Interactive Whiteboard Lesson Library

Dynamic Classroom with Dynamic Investigations

ANSWERS

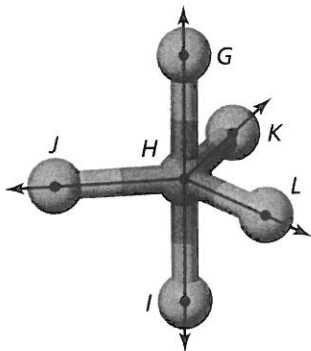
25. \overrightarrow{AD} and \overrightarrow{AC} are not opposite rays because A , C , and D are not collinear; \overrightarrow{AD} and \overrightarrow{AB} are opposite rays because A , B , and D are collinear, and A is between B and D .
26. \overrightarrow{YC} and \overrightarrow{YE} are segments; \overrightarrow{YC} and \overrightarrow{YE} are opposite rays.
27. J
28. C
29. Sample answer: D
30. Sample answer: A
31. Sample answer: C
32. Sample answer: B
33. \overrightarrow{AE}
34. \overrightarrow{CG}
35. point
36. plane
37. segment
38. point
39. P , Q , R , S
40. K , L , R , S
41. K , L , M , N
42. L , M , P , S
43. L , M , Q , R
44. M , N , R , S
45. yes; Use the point not on the line and two points on the line to draw the plane.
46. yes; Infinitely many planes can intersect any given point.

ANSWERS

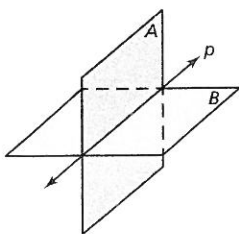
47. Three legs of the chair will meet on the floor to define a plane, but the point at the bottom of the fourth leg may not be in the same plane. When the chair tips so that this leg is on the floor, the plane defined by this leg and the two legs closest to it now lies in the plane of the floor; no; Three points define a plane, so the legs of the three-legged chair will always meet in the flat plane of the floor.
48. See Additional Answers.
49. 6; The first two lines intersect at one point. The third line could intersect each of the first two lines. The fourth line can be drawn to intersect each of the first 3 lines. Then the total is $1 + 2 + 3 = 6$.
- 50–72. See Additional Answers.

Mini-Assessment

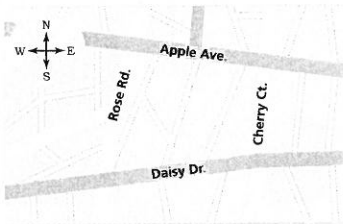
Use the diagram that shows a molecule of phosphorus pentachloride.



- Name three points that are not collinear. *Sample answer:* J, H, L
- Name two opposite rays. \overrightarrow{HG} , \overrightarrow{HI}
- Give another name for \overline{JH} . \overline{HJ}
- Name two different planes that contain \overline{HL} . *Sample answer:* plane HKL, plane HLI
- Sketch two planes A and B that intersect in line p .



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.



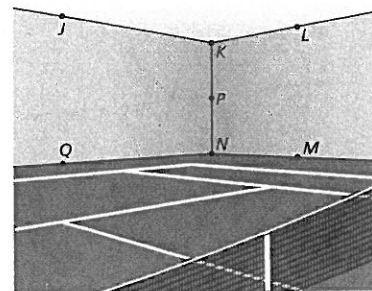
- Name two possibilities of the road and direction you and your friend may have traveled.
- Your friend claims he went north on Cherry Court, and you went east on Apple Avenue. Make an argument as to why you know this could not have happened.

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. $x - 23 = 19$

10 Chapter 1 Basics of Geometry

If students need help...

Resources by Chapter

- Practice A and Practice B
- Puzzle Time

Student Journal

- Practice

Differentiating the Lesson
Skills Review Handbook

If students got it...

Resources by Chapter

- Enrichment and Extension
- Cumulative Review

Start the *next* Section