Answers for 2.4

For use with pages 99–103

2.4 Skill Practice

1. line perpendicular to a plane

2. We don't know that they have the same measure.

3. Postulate 5

4. Postulate 9

5. a. If three points are not collinear, then there exists exactly one plane that contains all three points.

b. If there is a plane, then three noncollinear points exist on the plane; if three points are collinear, then there does not exist exactly one plane that contains all three; if there is not exactly one plane containing three points, then the three points are collinear.

c. all of them

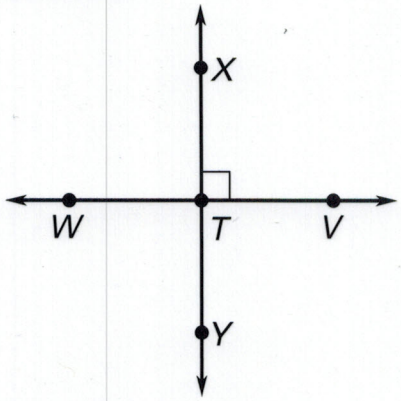
6–8. Sample answers are given.

6. line q containing points K and H

7. lines p and q intersecting in point H

8. points G, K, L contained in plane M

9. *Sample:*



no; $\overline{XY}$ does not necessarily bisect $\overline{WV}$.

10. B

11. False. *Sample answer:* Consider a highway with two houses on the right side and one house on the left.

12. true

13. False. *Sample answer:* Consider any pair of opposite sides of a rectangular prism.

14. true

15. false

16. false

17. false

18. false

19. true

20. false

21. true

22. true

23. false

24. C

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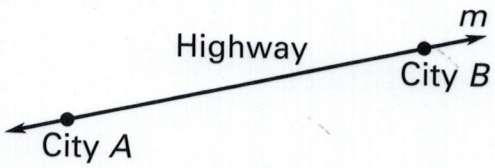
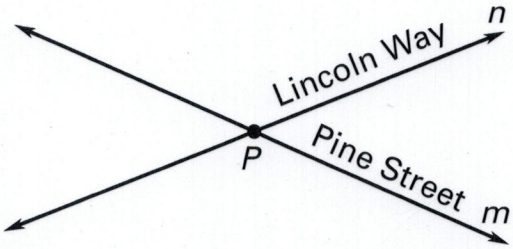
25. *Sample:*



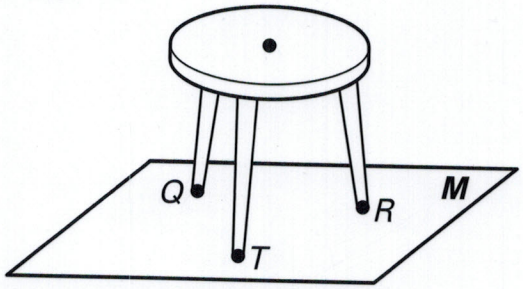
Postulate 5

Sample:



Postulate 7

Sample:



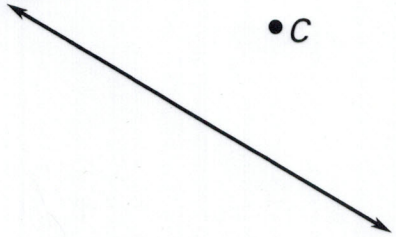
Postulate 8

26. *Sample answer:* A line contains at least two points; three points are sometimes contained in a line.

27. *Sample answer:* Postulate 9 guarantees three noncollinear points in a plane while Postulate 5 guarantees that through any two points there exists exactly one line; therefore there exists at least one line in the plane.

28. *Sample answer:* Postulate 9 guarantees three noncollinear points in the plane, one of them being X. If A and B are the other two points, then Postulate 5 guarantees $\overleftrightarrow{XA}$ and $\overleftrightarrow{XB}$ exist on plane M.

29. *m*



1 plane. *Sample answer:* Postulate 6 guarantees the existence of two points on line m and Postulate 8 guarantees the existence of one plane containing those two points and point C.

2.4 Problem Solving

30. Postulate 5

31. Postulate 7

32. Postulate 11

33. *Sample answer:* A stoplight with a red, yellow, and green light.

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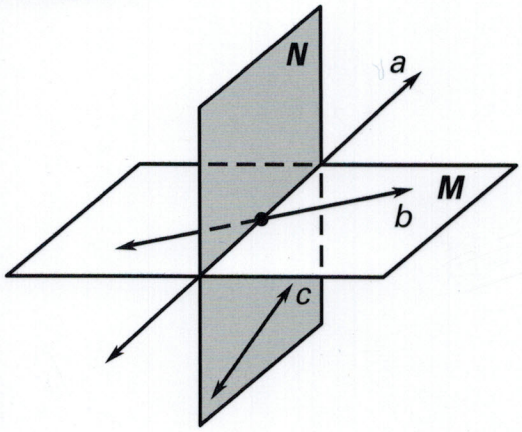
34. *Sample:*



35–38. Sample answers are given.

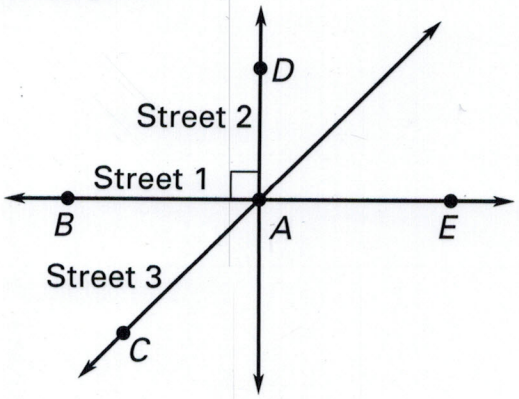
35. The line through $\overline{ZU}$ exists through points Z and U.

36. $\overleftrightarrow{SZ}$ and $\overleftrightarrow{ZU}$ intersect at point U.

37. The floor is a plane containing points W, X, and Y.

38. Points X and Y lie in the plane that is the floor, so $\overleftrightarrow{XY}$ also lies in the plane of the floor.

39. a. *Sample:*



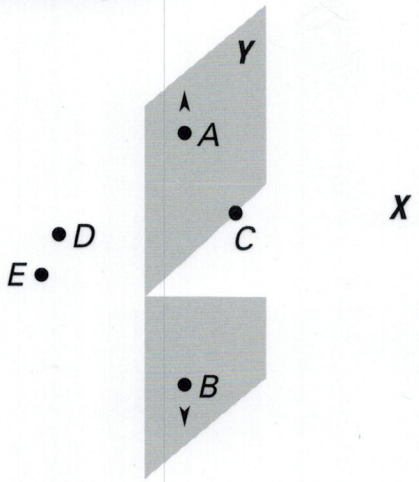
b. Building A

c. right angle

d. No; since $\angle CAE$ is obtuse, Building E must be on the east side of Building A.

e. Street 1

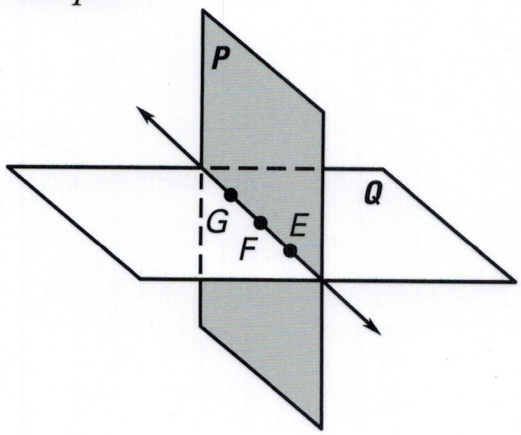
40. a–e. *Sample:*



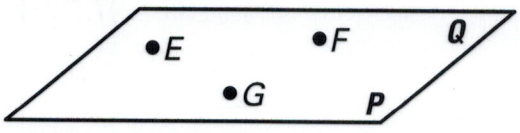
d. On the intersection of planes X and Y.

41. They must be collinear; they must be noncollinear.

Sample:



Sample:



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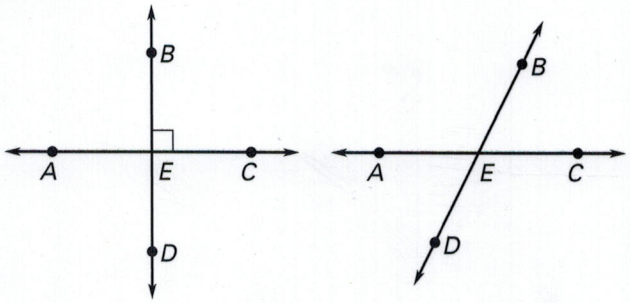
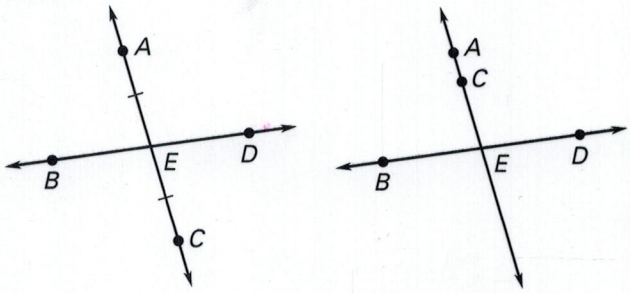
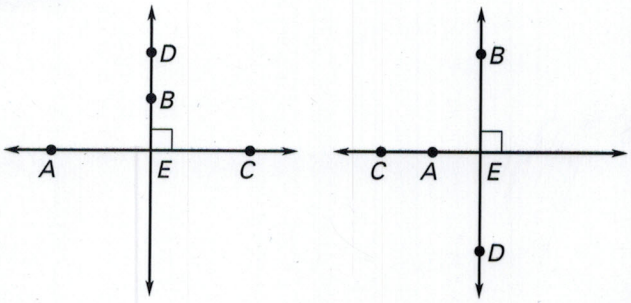
42.



43.



44.



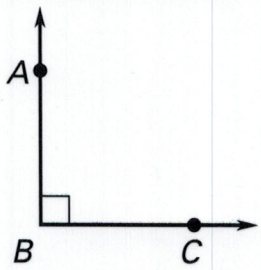
45. 4 planes; 2 planes; when the legs are all different lengths there are 4 different combinations of 3 of the 4 leg ends; when 3 of the legs are the same length, there are 2 different combinations of the leg ends.

2.4 Mixed Review

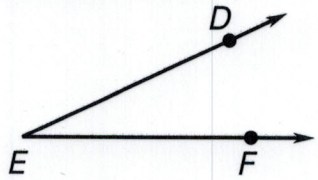
46. 27 **47.** 32 **48.** 18

49. 23 **50.** 74 **51.** 4

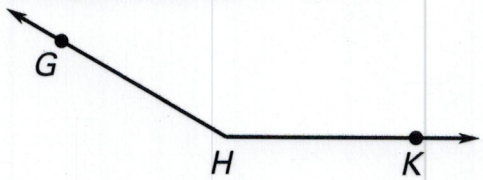
52. *Sample answer:*



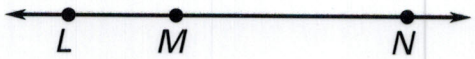
53. *Sample answer:*



54. *Sample answer:*



55. *Sample answer:*



56. 18°, 162°

2.1–2.4 Mixed Review of Problem Solving

1. a. *Sample answer:* The sun rises earlier each month until July.

b. *Sample answer:* 6:12 A.M.

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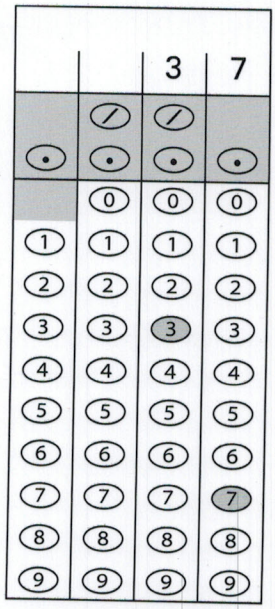
MR
3. 37

2. a. true

b. False. *Sample answer:* 100 miles per hour is less than 130 miles per hour but this hurricane is a category 2.

3. 37;



4. a. Inductive reasoning; conclusion is based on an observation.

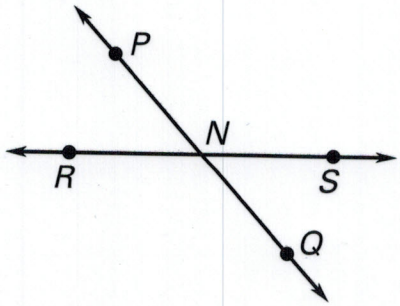
b. Deductive reasoning; it's a fact.

c. Inductive reasoning; conclusion is based on an observation.

5. a. Must have; you can't check out a book unless you have a library card.

b. May have visited; just because Bob has not been to the Hawaiian Islands doesn't mean he has not visited a volcano elsewhere.

6. *Sample:*



$\angle RNP$, $\angle SNQ$; they are each a linear pair with an obtuse angle.

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