Answers for Lesson 1-3, pp. 19–22 Exercises

1. no

2. yes; line n

3. yes; line n

4. yes; line m

5. yes; line n

6. no

7. no

8. yes; line m

9. Answers may vary. Sample: $\overleftrightarrow{AE}$, $\overleftrightarrow{EC}$, $\overleftrightarrow{GA}$

10. Answers may vary. Sample: $\overleftrightarrow{BF}$, $\overleftrightarrow{CD}$, $\overleftrightarrow{DF}$

11. $ABCD$

12. $EFHG$

13. $ABHF$

14. $EDCG$

15. $EFAD$

16. $BCGH$

17. $\overleftrightarrow{RS}$

18. $\overleftrightarrow{VW}$

19. $\overleftrightarrow{UV}$

20. $\overleftrightarrow{XT}$

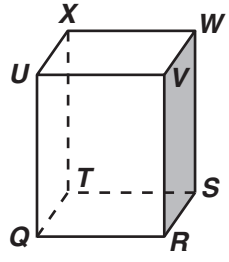
21. planes QUX and QUV

22. planes XTS and QTS

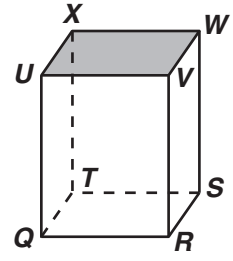
23. planes UXT and WXT

24. UVW and RVW

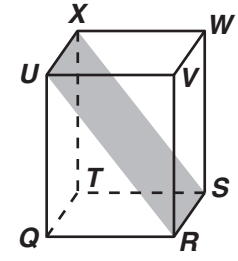
25.



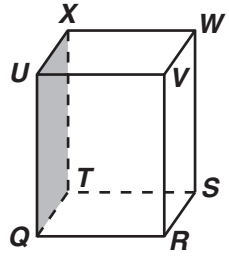
26.



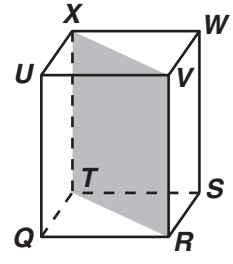
27.



28.



29.



30. S

31. X

32. R

33. Q

34. X

35. no

36. yes

37. no

38. coplanar

39. coplanar

40. noncoplanar

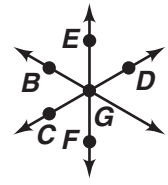
41. coplanar

42. noncoplanar

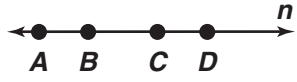
43. noncoplanar

44. Through any three noncollinear points there is exactly one plane. The ends of the legs of the tripod represent three noncollinear points, so they rest in one plane. Therefore, the tripod won't wobble.

45. Answers may vary. Sample:

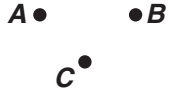


46.



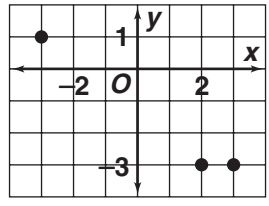
47. not possible

48.



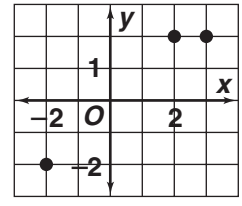
49. not possible

50.



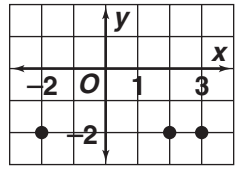
no

51.



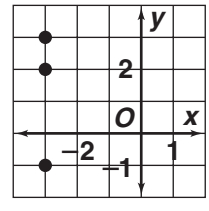
no

52.



yes

53.



yes

54. C

55. always

56. never

57. always

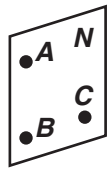
58. always

59. sometimes

60. never

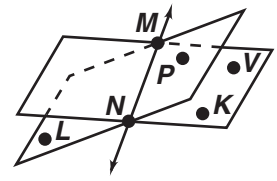
61. **a.** 1 **b.** 1 **c.** 1 **d.** 1

e. A line and a point not on the line are always coplanar.

62. 

Post. 1-4: Through three noncollinear points there is exactly one plane.

63. Answers may vary. Sample:



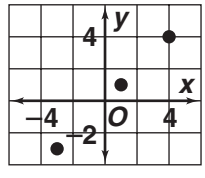
Post. 1-3: If two planes intersect, then they intersect in exactly one line.

64. A, B, and D

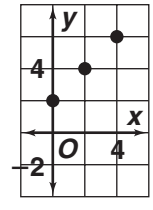
65. Post. 1-1: Through any two points there is exactly one line.

66. Post. 1-3: If two planes intersect, then they intersect in exactly one line.

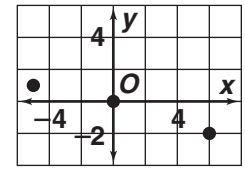
67. The end of one leg might not be coplanar with the ends of the other three legs. (Post. 1-4)

68. 

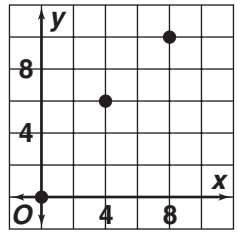
yes

69. 

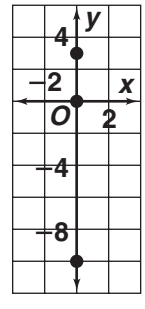
yes

70. 

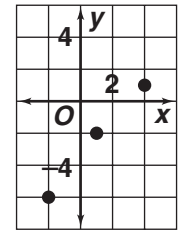
no

71. 

no

72. 

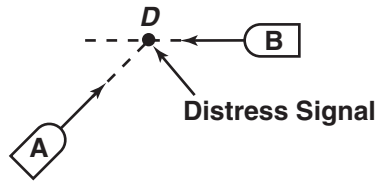
yes

73. 

no

74. Infinitely many; explanations may vary. Sample: Infinitely many planes can intersect in one line.

75.



By Post. 1-1, points D and B determine a line and points A and D determine a line. The distress signal is on both lines and, by Post. 1-2, there can be only one location for the distress signal.

76. a. Since the plane is flat, the line would have to curve so as to contain the 2 points and not lie in the plane; but lines are straight.

b. One plane; Points A, B, and C are noncollinear. By Post. 1-4, they are coplanar. Then, by part (a), $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$ are coplanar.

77. 1 **78.** $\frac{1}{4}$ **79.** 1