Answers for Lesson 5-3, pp. 275–278 Exercises

1. $(-2, -3)$ **2.** $(0, 0)$ **3.** $\left(1\frac{1}{2}, 1\right)$ **4.** $\left(2, -1\frac{1}{2}\right)$

5. $\left(-3, 1\frac{1}{2}\right)$ **6.** $\left(-3, -4\frac{1}{2}\right)$ **7.** $\left(3\frac{1}{2}, 3\right)$ **8.** C

9. Z

10. Find the ⊥ bisectors of the sides of the △ formed by the tennis court, the playground, and the volleyball court. That point will be equidistant from the vertices of the △.

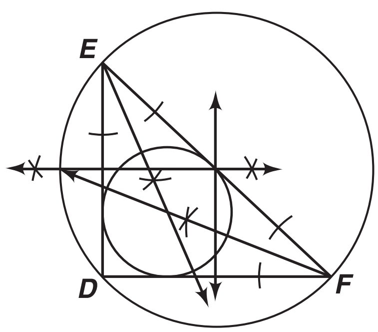
11. $TY = 18$; $TW = 27$ **12.** $ZY = 4\frac{1}{2}$; $ZU = 13\frac{1}{2}$

13. $VY = 6$; $YX = 3$ **14.** Median; A is a midpt.

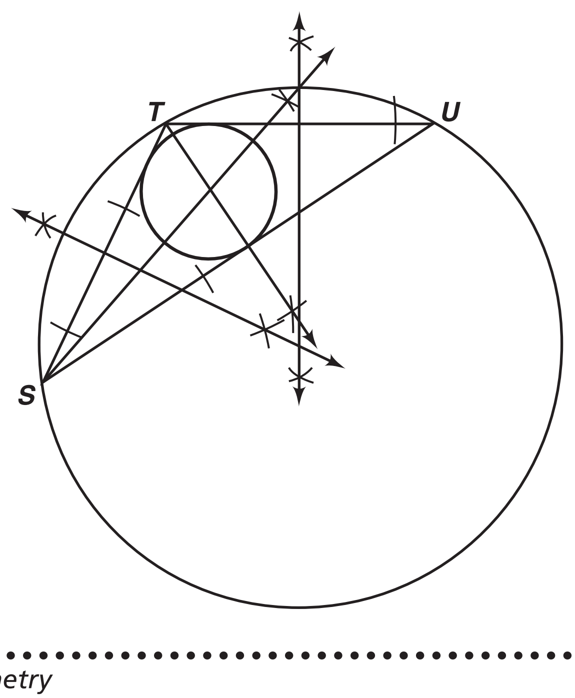
15. Neither; it's not a segment drawn from a vertex.

16. Altitude; $\overline{AB}$ is a segment drawn from a vertex of a △ perp. to the opp. side.

17.



18.



19. $\overline{BE}$ **20.** $\overline{FC}$ **21.** $\overrightarrow{CA}$ **22.** $\overline{DG}$

23. 1:2 or 2:1

24. Find the circumcenter of the △ formed by the three pines.

25–26. Check students' work.

27. D

28. **a.** ∠ bisector; it bisects an ∠.

b. None of these; it is a midsegment.

c. Altitude; $\overline{AB}$ is ⊥ to a side from a vertex.

29. **a.** $\overline{AB}$

b. $\overline{BC}$

c. XC

d. ⊥ bis.

30. It is given that X is on line ℓ and line m. By the ∠ Bisect. Thm., $XD = XE$ and $XE = XF$. By the Trans. Prop. of =, $XD = XE = XF$. X is on ray n by the Conv. of the Bis. Thm.

31. A right triangle; check students' explanations.

32. **a.** $L(1, 3); M(5, 3); N(4, 0)$

b. $\overleftrightarrow{AM}: y = \frac{3}{5}x$; $\overleftrightarrow{BN}: y = -3x + 12$; $\overleftrightarrow{CL}: y = -\frac{3}{7}x + \frac{24}{7}$

c. $\left(\frac{10}{3}, 2\right)$

d. $-\frac{3}{7}\left(\frac{10}{3}\right) + \frac{24}{7} = -\frac{10}{7} + \frac{24}{7} = \frac{14}{7} = 2$

e. $AM = \sqrt{34}$; $AP = \sqrt{\frac{136}{9}} = \frac{2}{3}\sqrt{34}$; $BN = \sqrt{40} = 2\sqrt{10}$; $BP = \sqrt{\frac{160}{9}} = \frac{4}{3}\sqrt{10}$; $CL = \sqrt{58}$; $CP = \sqrt{\frac{232}{9}} = \frac{2}{3}\sqrt{58}$

33. I-D; II-B; III-C; IV-A

34. I-A; II-C; III-B; IV-D

35. Answers may vary. Sample: Let $\triangle ABC$ be isosc. with base $\angle$s B and C. If $\overline{AD}$ bisects $\angle A$, then it is $\perp$ to $\overline{BC}$, and therefore the altitude from $\angle A$. So, $\overleftrightarrow{AD}$ contains the circumcenter, incenter, centroid, and orthocenter.

36. $\angle$ bisectors