Answers for Lesson 4-5, pp. 230–233 Exercises

1. $\overline{VX}$; Conv. of the Isosc. $\triangle$ Thm.

2. $\overline{UW}$; Conv. of the Isosc. $\triangle$ Thm.

3. $\overline{VY}$; $VT = VX$ (Ex. 1) and $UT = YX$ (Ex. 2), so $VU = VY$ by the Subtr. Prop. of $=$.

4. Answers may vary. Sample: $\angle VUY$; $\measuredangle$s opp. $\cong$ sides are $\cong$.

5. $x = 80; y = 40$

6. $x = 40; y = 70$

7. $x = 38; y = 4$

8. 150; 15

9. 24, 48, 72, 96, 120

10. 64

11. $2\frac{1}{2}$

12. 42

13. 35

14. 70

15. **a.** $\overline{KM}$

b. $\overline{KM}$

c. By construction

d. Def. of segment bisector

e. Reflexive Prop. of $\cong$

f. SSS

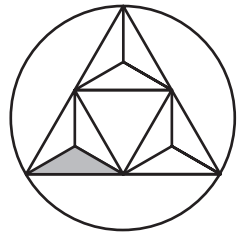
g. CPCTC

16. a. $\overline{RS}$

b. $\overline{RS}$

Statements	Reasons
1. $\overline{RS}$ bisects $\angle PRQ$	1. Given
2. $\angle$PRS $\cong \angle$QRS	2. Def. of bisector
3. $\angle P \cong \angle Q$	3. Given
4. $\overline{RS} \cong \overline{RS}$	4. Reflexive Prop. of $\cong$
5. $\triangle PRS \cong \triangle QRS$	5. AAS
6. $\overline{PR} \cong \overline{QR}$	6. CPCTC

17. a.



30, 30, 120

b. 5; 30, 60, 90, 120, 150

18. Answers may vary. Sample: Corollary to Thm. 4-3: Since $\overline{XY} \cong \overline{YZ}$, $\angle X \cong \angle Z$ by Thm. 4-3. $\overline{YZ} \cong \overline{ZX}$, so $\angle Y \cong \angle X$ by Thm. 4-3 also. By the Trans. Prop., $\angle Y \cong \angle Z$, so $\angle X \cong \angle Y \cong \angle Z$. Corollary to Thm. 4-4: Since $\angle X \cong \angle Z$, $\overline{XY} \cong \overline{YZ}$ by Thm. 4-4. $\angle Y \cong \angle X$, so $\overline{YZ} \cong \overline{ZX}$ by Thm. 4-4 also. By the Trans. Prop., $\overline{XY} \cong \overline{ZX}$, so $\overline{XY} \cong \overline{YZ} \cong \overline{ZX}$.

19. C

20. $x = 60; y = 30$

21. $x = 36; y = 36$

22. $x = 30; y = 120$

23. Two sides of a $\triangle$ are $\cong$ if and only if the $\measuredangle$s opp. those sides are $\cong$.

24. 80, 80, 20; 80, 50, 50

25. **a.** isosc. $\triangle$

b. 900 ft; 1100 ft

c. The tower is the $\perp$ bis. of the base of each $\triangle$.

26. No; the $\triangle$ can be positioned in ways such that the base is not on the bottom.

27. 45; they are $=$ and have sum 90.

28. $\angle A \cong \angle D$ by the Isos. $\triangle$ Thm. $\triangle ABE \cong \triangle DCE$ by SAS.

29. $\overline{AC} \cong \overline{CB}$ and $\angle ACD \cong \angle DCB$ are given. $\overline{CD} \cong \overline{CD}$ by the Refl. Prop. of $\cong$, so $\triangle ACD \cong \triangle BCD$ by SAS. So $\overline{AD} \cong \overline{DB}$ by CPCTC, and $\overline{CD}$ bisects $\overline{AB}$. Also $\angle ADC \cong \angle BDC$ by CPCTC, $m\angle ADC + m\angle BDC = 180$ by $\angle$ Add. Post., so $m\angle ADC = m\angle BDC = 90$ by the Subst. Prop. So $\overline{CD}$ is the $\perp$ bis. of $\overline{AB}$.

30. $m = 36; n = 27$

31. $m = 60; n = 30$

32. $m = 20; n = 45$

33. (0, 0), (4, 4), (−4, 0), (0, −4), (8, 4), (4, 8)

34. (5, 0); (0, 5); (−5, 5); (5, −5); (0, 10); (10, 0)

35. (5, 3); (2, 6); (2, 9); (8, 3); (−1, 6); (5, 0)

36. **a.** 25

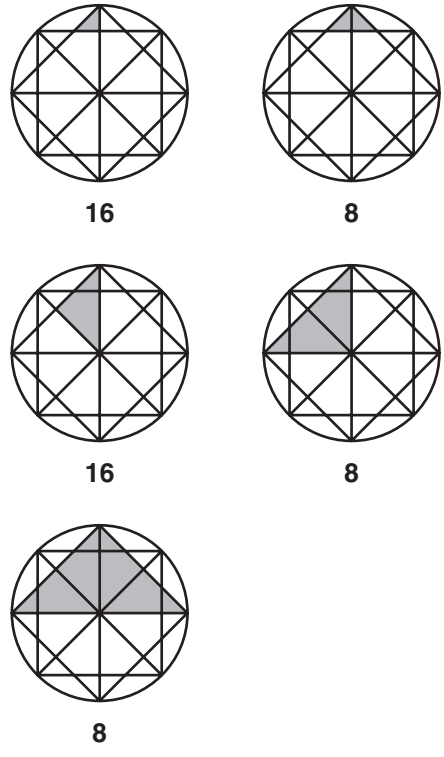
b. 40; 40; 100

c. Obtuse isosc. $\triangle$; 2 of the $\measuredangle$s are $\cong$ and one $\angle$ is obtuse.

37. The $\perp$ bis. of the base of an isosc. $\triangle$ is the bis. of the vertex $\angle$; given isosc. $\triangle ABC$ with $\perp$ bis. $\overline{CD}$, $\angle ADC \cong \angle BDC$ and $\overline{AD} \cong \overline{DB}$ by def. of $\perp$ bis. Since $\overline{CD} \cong \overline{CD}$ by Refl. Prop., $\triangle ACD \cong \triangle BCD$ by SAS. So $\angle ACD \cong \angle BCD$ by CPCTC, and $\overline{CD}$ bisects $\angle ACB$.

38. **a.** 5

b.



39. $0 <$ measure of base $\angle < 45$

40. $45 <$ measure of base $\angle < 90$