Answers for Lesson 5-5, pp. 292–294 Exercises

1. $\angle 3 \cong \angle 2$ because they are vertical $\angle$s and $m\angle 1 > m\angle 3$ by Corollary to the Ext. $\angle$ Thm. So, $m\angle 1 > m\angle 2$ by subst.

2. An ext. $\angle$ of a $\triangle$ is larger than either remote int. $\angle$.

3. $m\angle 1 > m\angle 4$ by Corollary to the Ext. $\angle$ Thm. and $\angle 4 \cong \angle 2$ because if $\parallel$ lines, then alt. int. $\angle$s are $\cong$.

4. $\angle M, \angle L, \angle K$

5. $\angle D, \angle C, \angle E$

6. $\angle G, \angle H, \angle I$

7. $\angle A, \angle B, \angle C$

8. $\angle E, \angle F, \angle D$

9. $\angle Z, \angle X, \angle Y$

10. $\overline{MN}, \overline{ON}, \overline{MO}$

11. $\overline{FH}, \overline{GF}, \overline{GH}$

12. $\overline{TU}, \overline{UV}, \overline{TV}$

13. $\overline{AC}, \overline{AB}, \overline{CB}$

14. $\overline{EF}, \overline{DE}, \overline{DF}$

15. $\overline{ZY}, \overline{XZ}, \overline{XY}$

16. No; $2 + 3 \not> 6$.

17. Yes; $11 + 12 > 15$; $12 + 15 > 11$; $11 + 15 > 12$.

18. No; $8 + 10 \not> 19$.

19. Yes; $1 + 15 > 15$; $15 + 15 > 1$.

20. Yes; $2 + 9 > 10$; $9 + 10 > 2$; $2 + 10 > 9$.

21. No; $4 + 5 \not> 9$.

22. $4 < s < 20$

23. $11 < s < 21$

24. $0 < s < 12$

25. $5 < s < 41$

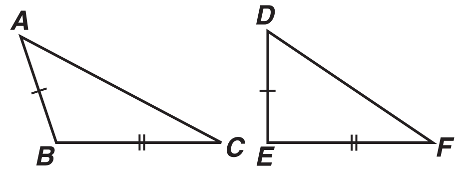
26. $3 < s < 11$

27. $15 < s < 55$

28. Answers may vary. Sample: If Y is the distance between Wichita and Topeka, then $20 < Y < 200$.

29. Let the distance between the peaks be d and the distances from the hiker to each of the peaks be a and b. Then $d + a > b$ and $d + b > a$. Thus, $d > b - a$ and $d > a - b$.

30. a.



b. The third side of the 1st △ is longer than the third side of the 2nd △.

c. See diagram in part (a).

d. The included ∠ of the first △ is greater than the included ∠ of the second △.

31. Answers may vary. Sample: The shortcut across the grass is shorter than the sum of the two paths.

32. $\overline{AB}$

33. a. $m\angle OTY$

b. $m\angle 3$

c. Base ⦞s of an isosc. △ are ≅.

d. ∠ Add. Post.

e. Comparison Prop. of Ineq.

f. Subst. (step 2)

g. An ext. ∠ of a △ is greater than either remote int. ∠.

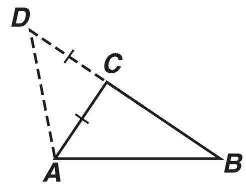
h. Trans. Prop. of Ineq.

34. $\angle T$ is the largest ∠ in $\triangle PTA$. Thus $PA > PT$ because the longest side of a △ is opp. the largest ∠.

35. $\overline{RS}$ **36.** $\overline{CD}$ **37.** $\overline{XY}$ **38.** $\frac{1}{2}$

39. (2, 4), (2, 5), (2, 6), (3, 3), (3, 4), (3, 6), (3, 7), (4, 3), (4, 4), (4, 5), (4, 6), (4, 7), (4, 8)

40. $\frac{5}{18}$

41. 

$CD = AC$ was given so $\triangle ACD$ is isos. by def. of isos. $\triangle$. This means $m\angle D = m\angle CAD$. Then $m\angle DAB > m\angle CAD$ by the Comparison Prop. of Ineq. So by subst., $m\angle DAB > m\angle D$ and by Thm. 5-11 $DB > AB$. Since $DC + CB = DB$, by subst. $DC + CB > AB$. Using subst. again, $AC + CB > AB$.