Answers for Lesson 3-4, pp. 150–152 Exercises

1. 30

2. 83.1

3. 90

4. $x = 70; y = 110; z = 30$

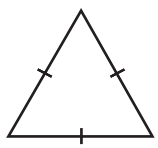
5. $x = 80; y = 80$

6. 60

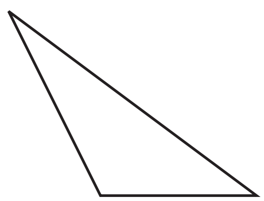
7. right, scalene

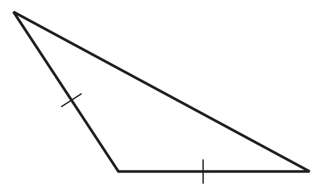
8. acute, equiangular, equilateral

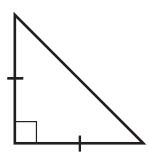
9. obtuse, isosceles

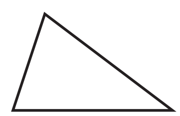
10. 

11. Not possible; a right △ will always have one longest side opp. the right ∠.

12. 

13. 

14. 

15. 

16. **a.** ∠5, ∠6, ∠8

b. ∠1 and ∠3 for ∠5
∠1 and ∠2 for ∠6
∠1 and ∠2 for ∠8

c. They are ≅ vert. ∠s.

17. **a.** 2

b. 6

18. 123

19. 115.5

20. $m\angle 3 = 92; m\angle 4 = 88$

21. $x = 147, y = 33$

22. $a = 162, b = 18$

23. $x = 7$; 55, 35, 90; right

24. $x = 37$; 37, 65, 78; acute

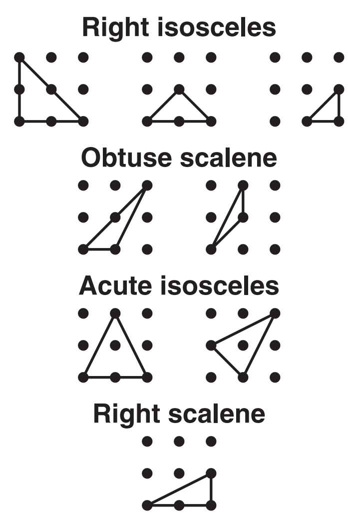
25. $x = 38, y = 36, z = 90$; $\triangle ABD$: 36, 90, 54; right; $\triangle BCD$: 90, 52, 38; right; $\triangle ABC$: 74, 52, 54; acute

26. $a = 67, b = 58, c = 125, d = 23, e = 90$; $\triangle FGH$: 58, 67, 55; acute; $\triangle FEH$: 125, 32, 23; obtuse; $\triangle EFG$: 67, 23, 90; right

27. 60; $180 \div 3 = 60$

28. Yes, an equilateral $\triangle$ is isosc. because if three sides of a $\triangle$ are $\cong$, then at least two sides are $\cong$. No, the third side of an isosc. $\triangle$ does not need to be $\cong$ to the other two.

29. eight



30. A

31. 30 and 60

32. **a.** 40, 60, 80

b. acute

33. Check students' work. Answers may vary. Sample: The two ext. ∠s formed at vertex A are vert. ∠s and thus have the same measure.

34. By the definition of right angle, $m\angle C = 90$.
By the Triangle Angle-Sum Theorem, $m\angle A + m\angle B + m\angle C = 180$.
Subtracting 90 from each side gives $m\angle A + m\angle B = 90$, so A and B are complementary by the definition of comp. angles.

35. $m\angle 1 + m\angle 4 = 180$ by the ∠ Add. Postulate.
$m\angle 2 + m\angle 3 + m\angle 4 = 180$ by the △ ∠-Sum Theorem.
$m\angle 1 + m\angle 4 = m\angle 2 + m\angle 3 + m\angle 4$ by the Trans. Property of Equality.
$m\angle 1 = m\angle 2 + m\angle 3$ by the Subtr. Property of Equality.

36. 132; since the third ∠ is 68, the largest ext. ∠ is $180 - 48 = 132$.

37. Check students' work.

38 **a.** 81

b. 45, 63, 72

c. acute

39. **a.–b.** There are no such triangles.

c. isosceles triangle.

40. 115

41. Answers may vary. Sample: The measure of the ext. ∠ is = to the sum of the measures of the two remote int. ∠s. Since these ∠s are ≅, the ∠s formed by the bisector of the ext. ∠ are ≅ to each of them. Therefore, the bisector is ∥ to the included side of the remote int. ∠s by the Conv. of the Alt Int. ∠s Thm.