Answers for 4.1

For use with pages 221–224

4.1 Skill Practice

1. C **2.** E **3.** F

4. A **5.** B **6.** D

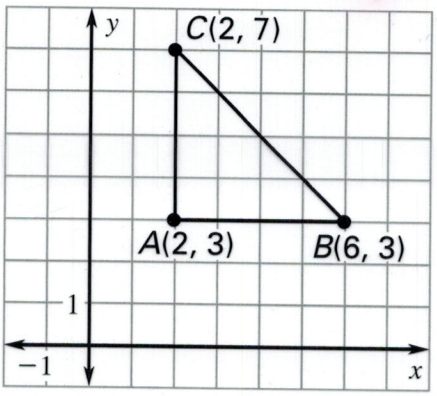
7. No; in a right triangle, the other two angles are complementary so they are both less than 90°.

8. isosceles, right

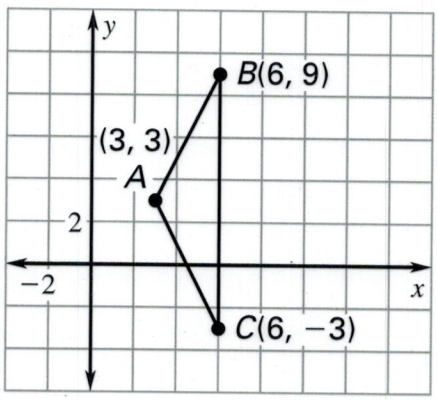
9. equilateral, equiangular

10. scalene, obtuse

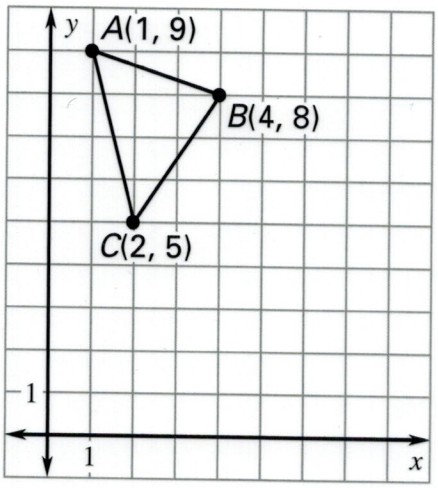
11. isosceles; right triangle



12. isosceles; not a right triangle



13. scalene; not a right triangle



14. 60; equiangular

15. 30; right **16.** 134; acute

17. 92° **18.** 114° **19.** 158°

20. Set $3x + 2x = 90$ and solve for x. Then find the values of $3x$ and $2x$.

21. 50° **22.** 130° **23.** 50°

24. 130° **25.** 40° **26.** 30°

27. $m\angle P = 45°$, $m\angle Q = 90°$, $m\angle R = 45°$

28. $m\angle E = 60°$, $m\angle F = 90°$, $m\angle G = 30°$

29. Isosceles does not guarantee the third side is congruent to the two congruent sides; so if $\triangle ABC$ is equilateral, then it is isosceles as well.

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30. The measure of the exterior angle is equal to the sum of the measures of the two non-adjacent interior angles; $m\angle 1 = 80° + 50° = 130°$.

31. B

32. 43, 32 **33.** 118, 96

34. 85, 65 **35.** 26, 64

36. 62, 28 **37.** 35, 37

38. No. *Sample answer:* In a right triangle, the two acute angles are complementary. So, one of the acute angle measures can be as small as desired, while the other angle measure is less than 90°. The largest angle is the right angle, which measures 90°, so the triangle does not need to be obtuse.

39. **a.** *Sample answer:* They will always form a triangle unless they intersect in one point, or unless at least two lines are parallel.

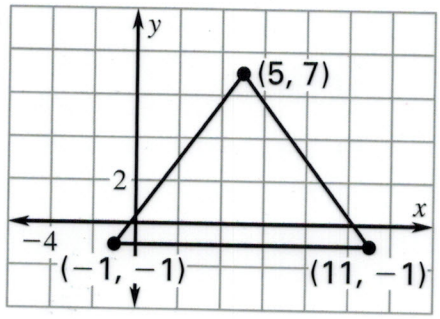
b. *Sample answer:* 0, 5

49. a. $2\sqrt{2x} + 5\sqrt{2x} + 2\sqrt{2x} = 180$

b. 40°, 100°, 40°

c. obtuse

c.



isosceles

4.1 Problem Solving

40. scalene; acute

41. 2 in.; 60°; in an equilateral triangle all sides have the same length $\left(\frac{6}{3}\right)$. In an equiangular triangle the angles always measure 60°.

42. Bend the strip again at 7 inches or bend the strip again at 8 inches.

43. C

44. 115° **45.** 115°

46. 130° **47.** 65°

48. Statements (Reasons)

1. $\triangle ABC$ is a right triangle. (Given)
2. $m\angle C = 90°$ (Definition of right angle)
3. $m\angle A + m\angle B + m\angle C = 180°$ (Triangle Sum Theorem)

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48. (cont.)

4. $m\angle A + m\angle B + 90° = 180°$
(Substitution Property of Equality)

5. $m\angle A + m\angle B = 90°$
(Subtraction Property of Equality)

6. $\angle A$ and $\angle B$ are complementary.
(Definition of complementary angles)

49. a. $2\sqrt{2x} + 5\sqrt{2x} + 2\sqrt{2x} = 180$

b. 40°, 100°, 40°

c. obtuse

50. Statements (Reasons)

1. $\triangle ABC$, exterior $\angle BCD$
(Given)

2. $m\angle ACD = 180°$
(Definition of straight angle)

3. $m\angle ACB + m\angle BCD = m\angle ACD$
(Angle Addition Postulate)

4. $m\angle ACB + m\angle BCD = 180°$
(Substitution Property of Equality)

5. $m\angle BCD = 180° - m\angle ACB$
(Subtraction Property of Equality)

6. $m\angle ACB + m\angle CBA + m\angle BAC = 180°$
(Triangle Sum Theorem)

7. $m\angle CBA + m\angle BAC = 180° - m\angle ACB$
(Subtraction Property of Equality)

8. $m\angle BCD = m\angle CBA + m\angle BAC$
(Transitive Property of Equality)

51. *Sample answer:* They both reasoned correctly, but their initial plan was incorrect. The measure of the exterior angle should be 150°.

52. a. 8, 9 **b.** one value

53. Statements (Reasons)

1. $\triangle ABC$, $\overline{AB} \parallel \overline{CD}$ (Given)

2. $m\angle ACE = 180°$
(Definition of straight angle)

3. $m\angle 3 + m\angle 4 + m\angle 5 = m\angle ACE$
(Angle Addition Postulate)

4. $m\angle 3 + m\angle 4 + m\angle 5 = 180°$
(Substitution)

5. $\angle 1 \cong \angle 5$
(Corresponding Angles Postulate)

6. $m\angle 1 = m\angle 5$
(Definition of congruent angles)

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53. (cont.)

7. $\angle 2 \cong \angle 4$
(Alternate Interior Angle Theorem)

8. $m\angle 2 = m\angle 4$
(Definition of congruent angles)

9. $m\angle 3 + m\angle 2 + m\angle 1 = 180°$
(Substitution Property of Equality)

4.1 Mixed Review

54. 49°, 41°

55. 30°, 60°

56. 52°, 38°

57. 2

58. 2

59. 7

60. $\angle PQR$, $\angle DEF$

61. 53°, 53°, 127°

62. 170°, 10°, 10°

63. 126°, 54°, 126°

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