Answers for Lesson 8-1, pp. 420–423 Exercises

1. 10 **2.** 7 **3.** 34

4. 12 **5.** 65 **6.** 8

7. No; $4^2 + 5^2 \neq 6^2$.

8. Yes; $10^2 + 24^2 = 26^2$.

9. Yes; $15^2 + 20^2 = 25^2$.

10. $\sqrt{41}$ **11.** $\sqrt{33}$

12. $3\sqrt{11}$ **13.** $2\sqrt{89}$

14. $3\sqrt{2}$ **15.** $5\sqrt{2}$

16. **a.** 14.1 ft **17.** 17.0 m

b. about 2.3 ft

18. No; $19^2 + 20^2 \neq 28^2$.

19. No; $8^2 + 24^2 \neq 25^2$. **20.** Yes; $33^2 + 56^2 = 65^2$.

21. acute **22.** obtuse

23. acute **24.** obtuse

25. right **26.** acute

27. 10 **28.** $8\sqrt{5}$

29. $2\sqrt{2}$

30. Answers may vary. Sample: Have three people hold the rope 3 units, 4 units, and 5 units apart in the shape of a triangle.

31. B **32.** 4.2 in.

33. Yes; $7^2 + 24^2 = 25^2$, so $\angle RST$ is a rt. $\angle$.

34. a. $|x_2 - x_1|; |y_2 - y_1|$

b. $PQ^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

c. $PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

35. Answers may vary. Sample: Using 2 segments of length 1, construct the hyp. of the right $\triangle$ formed by these segments. Using the hyp. found as one leg and a segment of length 1 as the other leg, construct the hyp. of the $\triangle$ formed by those legs. Continue this process until constructing a hypotenuse of length $\sqrt{n}$.

36. 29 **37.** 50 **38.** 84 **39.** 35

40–47. Answers may vary. Samples are given.

40. 6; 7

41. 4; 5

42. 8; 11

43. 11; 12

44. 8; 10

45. 14; 16

46. 18; 19

47. 39; 42

48. $\frac{r}{a} = \frac{a}{c}$ and $\frac{q}{b} = \frac{b}{c}$. So $a^2 = rc$ and $b^2 = qc$. $a^2 + b^2 = rc + qc = (r + q)c = c^2$

49. 2830 km

50. 12 cm

51. 12.5 cm

52. 17.9 cm

53. a. Answers may vary. Sample: $n = 6; 12, 35, 37$

b. $12^2 + 35^2 = 37^2$

c. $(2n)^2 + (n^2 - 1)^2$
$= 4n^2 + n^4 - 2n^2 + 1$
$= n^4 + 2n^2 + 1$
$= (n^2 + 1)^2$

54. a. 5 in.

b. $\sqrt{29}$

c. $d_2 = \sqrt{BD^2 + AC^2 + BC^2}$

d. 34 in.

55. $\sqrt{14}$ **56.** $\sqrt{61}$ **57.** $\sqrt{17}$

58. Draw right $\triangle FDE$ with legs $\overline{DE}$ of length a and $\overline{EF}$ of length b and hyp. of length x. Then $a^2 + b^2 = x^2$ by the Pythagorean Thm. We are given $\triangle ABC$ with sides of length a, b, c and $a^2 + b^2 = c^2$. By subst., $c^2 = x^2$, so $c = x$. Since all side lengths of $\triangle ABC$ and $\triangle FDE$ are the same, $\triangle ABC \cong \triangle FDE$ by SSS. $\angle C \cong \angle E$ by CPCTC, so $m\angle C = 90$. Therefore, $\triangle ABC$ is a right $\triangle$.