

LESSON

9

Exponents and Roots**Practice B: Applying the Pythagorean Theorem and its Converse**

1. The length of a rectangular swimming pool is 50 feet. The width of the pool is 20 feet. What is the length of the diagonal of the pool? Round your answer to the nearest tenth.
2. A map is placed on a coordinate grid. Cincinnati is located at $(5, 4)$ and San Diego is located at $(-10, -3)$. How far apart is Cincinnati from San Diego on the map? Round your answer to the nearest tenth.
3. Katie, Ralph, and Juan are tossing a football. Katie is 22.5 feet away from Ralph. Ralph is 58.5 feet away from Juan. Juan is 54 feet away from Katie. Do the distances between Katie, Ralph, and Juan form a right triangle? Explain.
4. A rectangular picture frame has a length of 7 inches and a width of 5 inches. What is the length of the diagonal of the picture frame? Round your answer to the nearest tenth.

Find the distance between the two points to the nearest tenth.

5. $(0, 5)$ and $(-4, 2)$
6. $(1, 9)$ and $(6, 3)$
7. $(-6, 4)$ and $(2, -6)$
8. $(-1, -7)$ and $(-3, -5)$
9. $(4, 0)$ and $(-9, 7)$
10. $(0, -8)$ and $(4, 0)$

Tell whether the given side lengths form a right triangle.

11. 7, 24, 25
12. 30, 40, 45
13. 21.6, 28.8, 36
14. 10, 15, 18
15. 10.5, 36, 50
16. 2.5, 6, 6.5

5.

row 6	13	84	85	$13^2 \times 84^2 \stackrel{?}{=} 85^2$; $7225 = 7225\checkmark$
row 10	21	220	221	$21^2 \times 220^2 \stackrel{?}{=} 221^2$; $48,841 = 48,841\checkmark$

Problem Solving

- | | |
|-------------|-------------|
| 1. 20.9 m | 2. 11.7 ft |
| 3. 127.3 ft | 4. 128.2 yd |
| 5. C | 6. H |
| 7. A | 8. G |

Reading Strategies

- | | |
|--|-------------------|
| 1. one | 2. legs |
| 3. a small square | 4. 90° |
| 5. the hypotenuse | 6. the hypotenuse |
| 7. No; Possible explanation: If there were two right angles, then two sides would never meet to form a triangle. | |

Puzzles, Twisters & Teasers

- | | |
|---------|---------|
| 1. 1.4 | 2. 10.6 |
| 3. 13.4 | 4. 10 |
| 5. 8.6 | 6. 5.4 |

T I E D T O A N Y T H I N G

Answers for Lesson 9

Practice A

- | | |
|------------|-----------|
| 1. 12.6 ft | 2. 3.6 mi |
| 3. 15 m | 4. 10.2 |
| 5. 5.8 | 6. 5.8 |
| 7. 7.3 | 8. 9.5 |
| 9. 13.0 | 10. no |
| 11. no | 12. yes |
| 13. no | 14. no |
| 15. yes | |

Practice B

- | | |
|----------------------------------|---------------|
| 1. 53.9 ft | 2. 16.6 units |
| 3. yes; $22.5^2 + 54^2 = 58.5^2$ | |
| 4. 8.6 in. | 5. 5 |
| 6. 7.8 | 7. 12.8 |

- | | |
|---------|---------|
| 8. 2.8 | 9. 14.8 |
| 10. 8.9 | 11. yes |
| 12. no | 13. yes |
| 14. no | 15. no |
| 16. yes | |

Practice C

- | | |
|------------|-----------|
| 1. 23.0 mi | 2. 13.4 m |
| 3. 14.8 | 4. 2.2 |
| 5. 15.8 | 6. 10.8 |
| 7. 4 | 8. 9.2 |
| 9. yes | 10. no |
| 11. yes | 12. yes |
| 13. no | 14. no |
| 15. yes | 16. no |
| 17. no | 18. no |
| 19. yes | 20. yes |

Review for Mastery

- | | |
|-----------|----------|
| 1. 5 | 2. 13 |
| 3. 4.5 | 4. 5.4 |
| 5. 12 in. | 6. 15 mm |

Challenge

1. scalene; $AB = \sqrt{(4-0)^2 + (4-4)^2}$
 $= \sqrt{4^2 + 0^2} = \sqrt{16+0} = \sqrt{16} = 4$;
 $AC = \sqrt{(3-0)^2 + (-2-4)^2}$
 $= \sqrt{3^2 + (-6)^2} = \sqrt{9+36} = \sqrt{45} \approx 6.7$;
 $BC = \sqrt{(4-3)^2 + (4-(-2))^2} = \sqrt{1^2 + (-6)^2} =$
 $\sqrt{1+36} = \sqrt{37} \approx 6.1$
2. isosceles; $DE = \sqrt{(2-0)^2 + (5-1)^2}$
 $= \sqrt{2^2 + 4^2} = \sqrt{4+16} = \sqrt{20} \approx 4.5$;
 $DF = \sqrt{(2-4)^2 + (5-1)^2} = \sqrt{(-2)^2 + 4^2}$
 $= \sqrt{4+16} = \sqrt{20} \approx 4.5$;
 $EF = \sqrt{(4-0)^2 + (1-1)^2} = \sqrt{4^2 + 1^2}$
 $= \sqrt{16+1} = \sqrt{17} \approx 4.1$