Warm Up 42

1. perpendicular
2. $a^2 + b^2 = c^2$
3. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
4. 3
5. $\frac{1}{2}$

Lesson Practice 42

a. 11

b. 12

c. 4.47

d. (2, 5)

e. He lives 0.95 miles away, so he cannot ride the bus.

Practice 42

1. By making the new support 18 in. long, Denzel can make sure that hypotenuses are congruent; by fixing it 10 in. below the roof, he can make sure that a pair of legs are congruent; by the HL Congruence Theorem, this makes sure that triangles are congruent.

2. 52.2 feet

3. 100°

4. obtuse; right; acute

5. Using the Triangle Sum Theorem, $\angle C$ is equal to 23°, which is smaller than the corresponding angle in the second triangle at vertex *F*, so *DE* is longer.

6.

Statements	Reasons
1. $\angle 1$ and $\angle 2$ are straight angles	1. Given
2. $m\angle 1 = 180°$, $m\angle 2 = 180°$	2. Definition of straight angles
3. $m\angle 1 = m\angle 2$	3. Substitute
4. $\angle 1 \cong \angle 2$	4. Definition of congruent angles

7. D

8. Since $\angle B$ and $\angle E$ are right angles, $\triangle ABC$ and $\triangle DEF$ are right triangles; $\overline{BC} \cong \overline{EF}$ and $\angle C \cong \angle F$; by the LA Theorem, $\triangle ABC \cong \triangle DEF$.

9. 7.21

10. -4

11. 32 cm^2

12. 45 inches

13. Answers will vary. Any answer of the form $5n$, $12n$, $13n$ will be a Pythagorean triple, where n is a positive integer.

14.

Statements	Reasons
1. $m\angle ABC = 60°$, $m\angle BCD = 60°$, $m\angle CDE = 75°$, $m\angle CED = 45°$	1. Given
2. $m\angle ACD = m\angle CDE + m\angle DCE$	2. Exterior Angle Theorem
3. $m\angle ACD = 75° + 45°$	3. Substitute
4. $m\angle ACD = 120°$	4. Simplify
5. $m\angle ACB + m\angle BCD = m\angle ACD$	5. Adjacent Angle Sum
6. $m\angle ACB + 60° = 120°$	6. Substitute
7. $m\angle ACB + 60° - 60° = 120° - 60°$	7. Subtraction Property of Equality
8. $m\angle ACB = 60°$	8. Simplify
9. $m\angle ABC = m\angle BCA + m\angle BAC = 120°$	9. Triangle Sum Theorem
10. $60° + 60° + m\angle BAC = 180°$	10. Substitute
11. $120° + m\angle BAC = 180°$	11. Simplify
12. $120° + m\angle BAC - 120° = 180° - 120°$	12. Subtraction Property of Equality
13. $m\angle BAC = 60°$	13. Simplify
14. $m\angle BAC = m\angle ABC$	14. Transitive Property of Equality

15. The distance is zero, because the point is on the line.

16. 13.45

17.

Statements	Reasons
1. $AB = CD$	1. Given
2. $m\angle BAE \cong m\angle DCE$	2. Given
3. $m\angle AEB \cong m\angle CED$	3. Vertical Angles Theorem
4. $\triangle ABE \cong \triangle CDE$	4. AAS Congruence Theorem

18. $\overline{RS}$

19. Angles 2 and 3 are vertical angles, so they are congruent; Since $\angle 1 \cong \angle 3$ and $\angle 2 \cong \angle 3$, by the Transitive Property of Congruence $\angle 1 \cong \angle 2$; $\angle 1$ and $\angle 2$ are also corresponding angles, so by the Converse of the Corresponding Angles Postulate, lines p and q are parallel.

20. Since $4x$ is the longest side, it would be opposite the angle with the greatest measure.

21. slope is $\frac{1}{4}$; $y = \frac{1}{4}x + 1$

22. Given; Distributive Property; Subtraction Property of Equality; Simplify; Division Property of Equality; Simplify

23. 4.2

24. If the product of two numbers is positive, then the two numbers are positive; Two numbers are positive if and only if their product is positive.

25.

$A = 4, b = 2x + 4, h = x - 1$	Given
$A = \frac{bh}{2}$	Area of a triangle
$\frac{(2x + 4)(x - 1)}{2} = 4$	Substitution Property of Equality
$x^2 + x - 2 = 4$	Simplify.
$x^2 + x - 2 - 4 = 4 - 4$	Subtraction Property of Equality
$x^2 + x - 6 = 0$	Simplify.
$(x + 3)(x - 2) = 0$	Factor.
$x - 2 = 0$	$x > 0$
$x - 2 + 2 = 0 + 2$	Addition Property of Equality
$x = 2$	Simplify.

26. $\frac{x}{x + 5} = \frac{4}{9}$, $x = 4$, $KL = 4$ units, $QR = 9$ units

27. $x = 5$; $PC = 12$; $CM = 6$; $PM = 18$

28. **a.** True, because all angles in squares are congruent 90° angles, and since all the sides of a square have the same measure, each side of one square is proportional to another.

b. False, because although all angles in rectangles and squares are congruent, the sides are not proportional (unless the rectangle is a square).

29. obtuse triangle; Pythagorean Inequality Theorem

30. a: 4 cm^2; b: 2 cm^2; c: 8 cm^2; d: 4 cm^2; e: 8 cm^2