

Answers for 7.3

For use with pages 453–456

7.3 Skill Practice

1. similar
2. *Sample answer:* Geometric mean is the proportion created by part of the hypotenuse to the altitude and the altitude to the rest of the hypotenuse or the hypotenuse to either the small or large leg of the large triangle to hypotenuse and corresponding leg of the smaller triangle.
3. $\triangle FHG \sim \triangle HEG \sim \triangle FEH$
4. $\triangle KML \sim \triangle MNL \sim \triangle KNM$
5. 53.7 ft 6. 11.1 ft 7. 6.7 ft
8. $\triangle YZX \sim \triangle ZWX \sim \triangle YWZ$; ZW
9. $\triangle QSR \sim \triangle STR \sim \triangle QTS$; RQ
10. $\triangle GEF \sim \triangle HEG \sim \triangle HGF$; EH
11. *Sample answer:* The proportion must compare corresponding parts; $\frac{v}{z} = \frac{z}{w + v}$.
12. When using the altitude and parts of the hypotenuse, you must use both pieces of the large triangle's hypotenuse, $\frac{e}{d} = \frac{d}{g}$.
13. about 6.7 14. 27
15. about 45.6 16. 6
17. about 6.3 18. about 6.9

19. C

20. C

21. 3

22. 1.5

23. $x = 9, y = 15, z = 20$

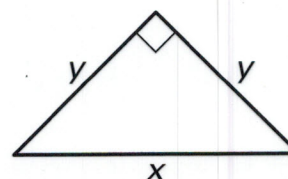
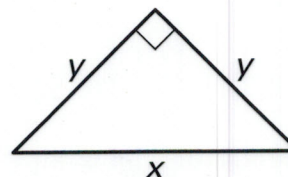
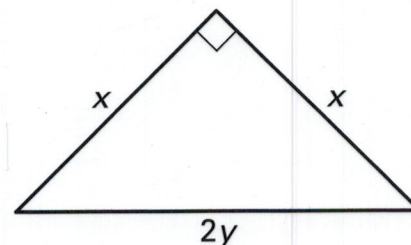
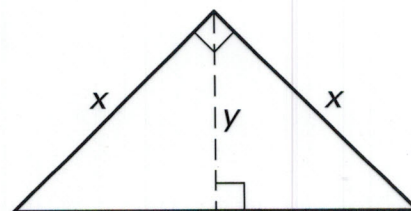
24. right triangle; about 8.5

25. right triangle; about 6.7

26. not a right triangle

27. 25, 12

28.



Sample answer: The two smaller triangles are congruent to each other and are also isosceles triangles.

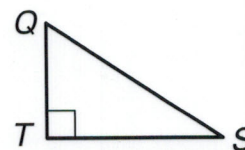
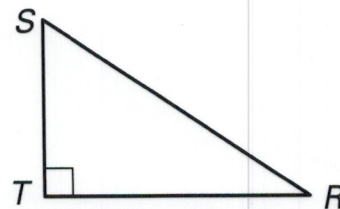
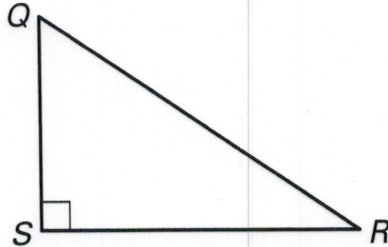
Answers for 7.3 *continued*

For use with pages 453–456

7.3 Problem Solving

29. about 1.1 ft
30. about 14.9 ft
31. about 15 ft; no; the values are slightly off because the measurements are not exact.
32. 1. Given
2. Geometric Mean (Leg) Theorem
3. Cross Products Property
4. a^2
5. Substitution Property of Equality
6. Distributive Property
7. c
8. Substitution Property of Equality
33. a. \overline{FH} , \overline{GF} , \overline{EF} ; each segment has a vertex as an endpoint and is perpendicular to the opposite side.
b. $\sqrt{35}$
c. about 35.5

34. a. Q



The right angles correspond and from there you find the shorter leg and the longer leg, keeping in mind which way you choose and being consistent with all three triangles.

- b. $\triangle QSR \sim \triangle STR \sim \triangle QTS$
- c. \overline{RS} . Sample answer: \overline{RQ} is the hypotenuse of the large triangle and \overline{RT} is the long leg of the medium triangle, so the relationship for the geometric mean requires a segment that is a hypotenuse and a long leg.

Answers for 7.3 *continued*

For use with pages 453–456

35. Statements (Reasons)

1. $\triangle ABC$ is a right triangle;
altitude \overline{CD} is drawn to
hypotenuse \overline{AB} . (Given)
2. $\angle CDB$ is a right angle.
(Definition of altitude)
3. $\angle B \cong \angle B$
(Reflexive Property
of Congruence)
4. $\angle CDB \cong \angle ACB$
(Right Angle Congruence
Theorem)
5. $\triangle CBD \sim \triangle ABC$
(AA Similarity Postulate)
6. $\angle CDB$ is a right angle.
(Definition of perpendicular)
7. $\angle A \cong \angle A$
(Reflexive Property
of Congruence)
8. $\angle CDA \cong \angle BCA$
(Right Angle Congruence
Theorem)
9. $\triangle ACD \sim \triangle ABC$
(AA Similarity Postulate)
10. $\angle ACD \cong \angle B$
(Congruent Complements
Theorem)

11. $\angle ACD \cong \angle CDB$
(Right Angle Congruence
Theorem)

12. $\triangle ADC \sim \triangle CDB$
(AA Similarity Postulate)

36. Statements (Reasons)

1. $\triangle ABC$ is a right triangle;
altitude \overline{CD} is drawn to
hypotenuse \overline{AB} . (Given)
2. $\triangle ADC \sim \triangle CBD$
(If an altitude is drawn to the
hypotenuse of a right triangle,
then the two triangles formed
are similar to the original
triangle and to each other.)
3. $\frac{CD}{AD} = \frac{BD}{CD}$
(Definition of similar figures)

Answers for 7.3 *continued*

For use with pages 453–456

37. Statements (Reasons)

1. $\triangle ABC$ is a right triangle;
altitude \overline{CD} is drawn to
hypotenuse \overline{AB} . (Given)

2. $\triangle ABC \sim \triangle CBD$
(If an altitude is drawn to the
hypotenuse of a right triangle,
then the two triangles formed
are similar to the original
triangle and to each other.)

3. $\frac{AB}{CB} = \frac{BC}{BD}$
(Definition of similar figures)

4. $\triangle ABC \sim \triangle ACD$
(If an altitude is drawn to the
hypotenuse of a right triangle,
then the two triangles formed
are similar to the original
triangle and to each other.)

5. $\frac{AB}{AC} = \frac{AC}{AD}$
(Definition of similar figures)

38. a. 12

b. 8.4

c. Yes; when you compute the
harmonic mean using 4 and 12,
you get 6.

7.3 Mixed Review

39. $3\sqrt{6}$

40. $4\sqrt{5}$

41. $2\sqrt{21}$

42. $6\sqrt{6}$

43. $\frac{5\sqrt{7}}{7}$

44. $\frac{8\sqrt{11}}{11}$

45. $\frac{5\sqrt{3}}{3}$

46. $\sqrt{6}$

47. Perpendicular; the slope of line 1
is -1 , the slope of line 2 is 1 , and
 $-1 \cdot 1 = -1$.

48. Parallel; the slope of each line
is 3 .

49. Neither; the slope of line 1 is 0 ,
the slope of line 2 is 1 , and $0 \neq 1$
and $0 \cdot 1 \neq -1$.