Name ______________________________ Date ______________

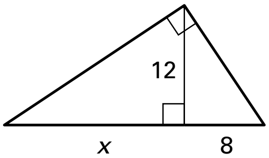
LESSON 7.3

Practice B

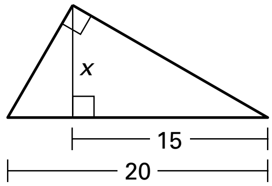
For use with pages 466–474

Complete and solve the proportion.

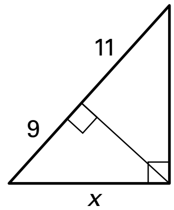
1. $\frac{x}{12} = \frac{?}{8}$



2. $\frac{15}{x} = \frac{x}{?}$

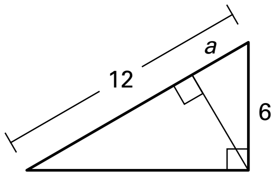


3. $\frac{9}{x} = \frac{x}{?}$

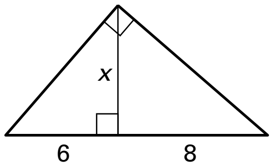


Find the value(s) of the variable(s).

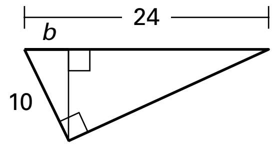
4.



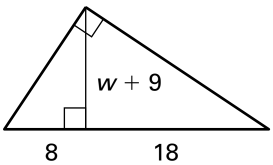
5.



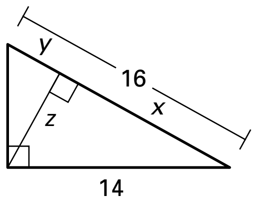
6.



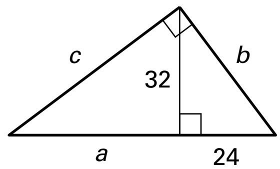
7.



8.

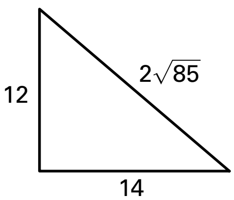


9.

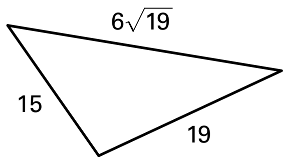


Tell whether the triangle is a right triangle. If so, find the length of the altitude to the hypotenuse. Round decimal answers to the nearest tenth.

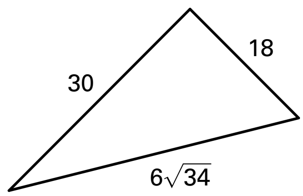
10.



11.

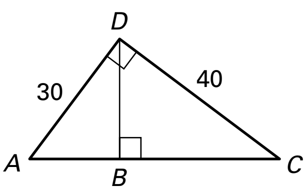


12.

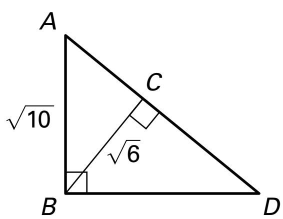


Use the Geometric Mean Theorems to find *AC* and *BD*.

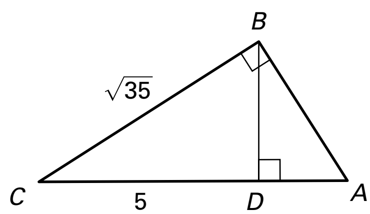
13.



14.



15.



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LESSON 7.3

Name ______________________ Date ____________

LESSON 7.3

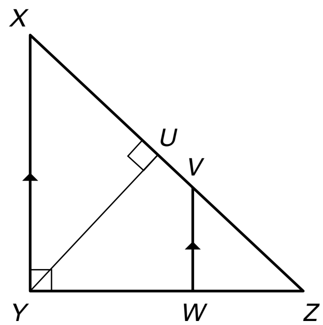
Practice B *continued*

For use with pages 466–474

16. Complete the proof.

GIVEN: $\triangle XYZ$ is a right triangle with $m\angle XYZ = 90°$.
$\overline{VW} \parallel \overline{XY}$, $\overline{YU}$ is an altitude of $\triangle XYZ$.

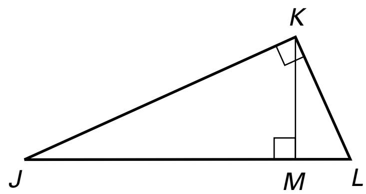
PROVE: $\triangle YUZ \sim \triangle VWZ$



Statements	Reasons
1. $\triangle XYZ$ is a right $\triangle$ with altitude $\overline{YU}$.	**1.** ___?___
2. $\triangle XYZ \sim \triangle YUZ$	**2.** ___?___
3. $\overline{VW} \parallel \overline{XY}$	**3.** ___?___
4. $\angle VWZ \cong \angle XYZ$	**4.** ___?___
5. $\angle Z \cong \angle Z$	**5.** ___?___
6. ___?___	**6.** AA Similarity Postulate
7. $\triangle YUZ \sim \triangle VWZ$	**7.** ___?___

In Exercises 17–19, use the diagram.

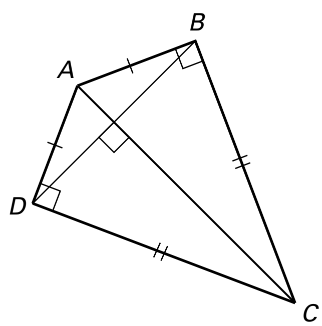
17. Sketch the three similar triangles in the diagram. Label the vertices.



18. Write similarity statements for the three triangles.

19. Which segment's length is the geometric mean of LM and JM?

20. **Kite Design** You are designing a diamond-shaped kite. You know that $AB = 38.4$ centimeters, $BC = 72$ centimeters, and $AC = 81.6$ centimeters. You want to use a straight crossbar $\overline{BD}$. About how long should it be?



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Lesson 7.3, continued

Practice Level B

1. 12; 18 **2.** 5; $5\sqrt{3}$ **3.** 20; $6\sqrt{5}$ **4.** $a = 3$

5. $x = 4\sqrt{3}$ **6.** $b = \frac{25}{6}$ **7.** $w = 3$

8. $x = 12.25, y = 3.75, z = \frac{7\sqrt{15}}{4}$

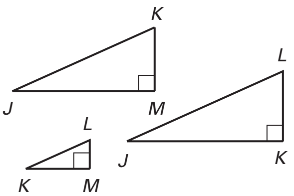
9. $a = 42\frac{2}{3}, b = 40, c = 53\frac{1}{3}$ **10.** yes; 9.1

11. no **12.** yes; 15.4 **13.** $AC = 50, BD = 24$

14. $AC = 2, BD = \sqrt{15}$ **15.** $AC = 7, BD = \sqrt{10}$

16. 1. Given **2.** Theorem 7.5 **3.** Given **4.** Corresponding Angles Postulate **5.** Reflexive Property of Congruence **6.** $\triangle XYZ \sim \triangle VWZ$ **7.** Transitive Property

17.



18. $\triangle LKJ \sim \triangle KMJ$, $\triangle LKJ \sim \triangle LMK$, $\triangle KMJ \sim \triangle LMK$ **19.** $\overline{KM}$ **20.** about 67.8 cm

Practice Level C

1. $\triangle FED \sim \triangle FGE \sim \triangle EGD$; EG

2. $\triangle MQP \sim \triangle MNQ \sim \triangle QNP$; NQ

3. $\triangle RST \sim \triangle RUS \sim \triangle SUT$; RS

4. $m = 4$ **5.** $n = 3\sqrt{6}$ **6.** $k = 4$ **7.** $w = 6$

8. $y = 3$ **9.** $a = 14$ **10.** yes; 11.5

11. yes; 17.7 **12.** no **13.** $AC = 34, BD = \frac{240}{17}$

14. $AC = \sqrt{30}, BD = \frac{15\sqrt{2}}{2}$

15. $AC = \frac{62\sqrt{17}}{17}, BD = 2\sqrt{14}$

16. 1. Given; **2.** Geometric Mean (Altitude) Theorem 7.6; **3.** Given; **4.** Substitution; **5.** Solve for UZ; **6.** Pythagorean Theorem; **7.** Solve for YZ; **8.** Substitution; **9.** Simplify

17. *Sample Answer:*

Because $\frac{AB}{CB} = \frac{CB}{DB}$, $(BC)^2 = (CB)^2 = AB \cdot BD$.

Because $\frac{AB}{AC} = \frac{AC}{AD}$, $(AC)^2 = AB \cdot AD$.

Therefore, $\frac{(AC)^2}{(BC)^2} = \frac{AB \cdot AD}{AB \cdot BD} = \frac{AD}{BD}$.

18. $AC = x\sqrt{x^2 + y^2}$; $BC = y\sqrt{x^2 + y^2}$; $CD = xy$

Review for Mastery

1. $\frac{336}{25}$ **2.** $\frac{540}{51}$ **3.** $4\sqrt{5}$ **4.** $5\sqrt{6}$

Problem Solving Workshop: Worked Out Example

1. 19.5 ft **2.** about 3 m

Challenge Practice

1. $PR = 12.5, QS = 12$

2. By Theorem 7.7,

$\frac{AC}{h} = \frac{b}{CE}, h^2 = (AC)(CE)$;

$\frac{CB}{h} = \frac{h}{CF}, h^2 = (CB)(CF)$.

Thus, $(AC)(CE) = (CB)(CF)$.

Because $AC = CB$, $(AC)(CE) = (AC)(CF)$ $CE = CF$. Because $AC = BC$, $AE = BF$.

By Theorem 7.7,

$\frac{AC}{AD} = \frac{AD}{AE}, (AD)^2 = (AC)(AE)$;

$\frac{BC}{BD} = \frac{BD}{BF}, (BD)^2 = (BC)(BF) =$

$(AC)(AE) = (AD)^2$.

Because $(BD)^2 = (AD)^2$, $BD = AD$.

Because $\triangle ACD$ and $\triangle BCD$ share side CD, by SSS the two triangles are congruent.

3. Given: $\angle DFG \cong \angle FCD$, then $m\angle DFC = 90°$.

Using Theorem 7.7,

$\frac{BC}{CF} = \frac{CF}{CE}$ and $\frac{CD}{CF} = \frac{CF}{CG}$.

$BC = \frac{(CF)^2}{CE}$ and $CD = \frac{(CF)^2}{CG}$.

So, $\frac{BC}{CD} = \frac{\frac{(CF)^2}{CE}}{\frac{(CF)^2}{CG}} = \frac{CG}{CE}$.

By substitution, $\frac{BC}{CD} = \frac{EF}{CE}$.

The rectangles are similar.

4. $\left(\frac{48}{25}, \frac{36}{25}\right)$ **5.** $(0, 0)$ **6.** $\left(-\frac{16}{13}, -\frac{28}{13}\right)$

7. $\left(-\frac{6}{5}, \frac{32}{5}\right)$ **8.** $\left(-\frac{227}{58}, \frac{205}{58}\right)$ **9.** $(1, -3)$ **10.** $\frac{\sqrt{5}}{5}$

11. 72.6 mi **12.** $20\frac{5}{8}$ mi

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