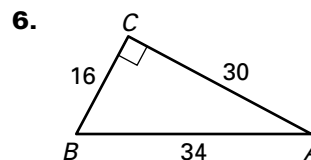
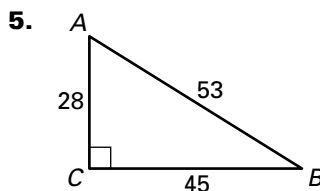
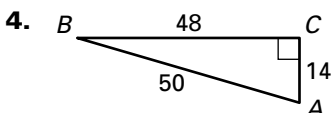
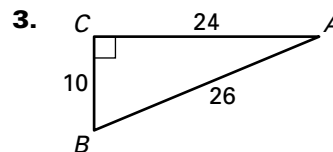
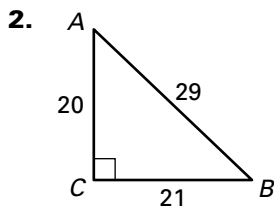
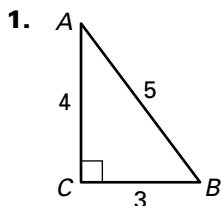


LESSON
7.5

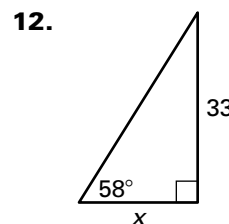
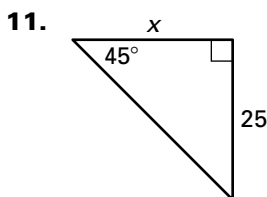
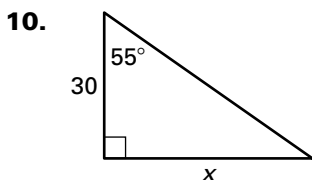
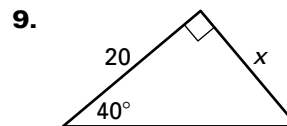
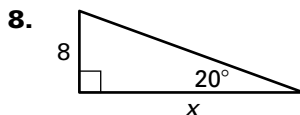
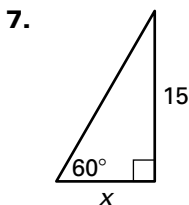
Practice A

For use with pages 484–490

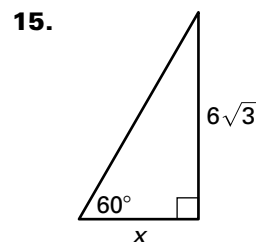
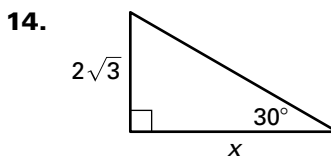
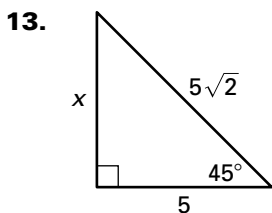
Find $\tan A$ and $\tan B$. Write each answer as a fraction and as a decimal rounded to four places.



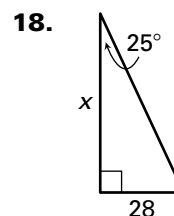
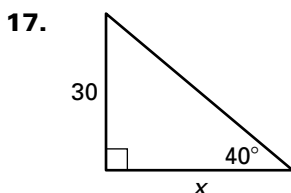
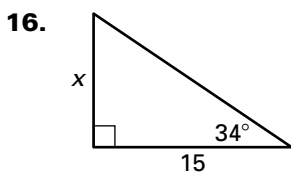
Find the value of x to the nearest tenth.



Find the value of x using the definition of tangent. Then find the value of x using the 45° - 45° - 90° Triangle Theorem or the 30° - 60° - 90° Triangle Theorem. Compare the results.



Use a tangent ratio to find the value of x . Round to the nearest tenth.



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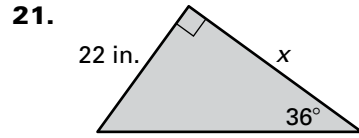
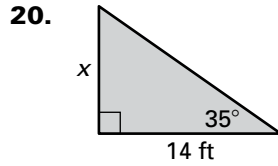
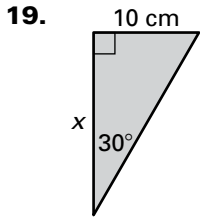
LESSON 7.5

LESSON
7.5

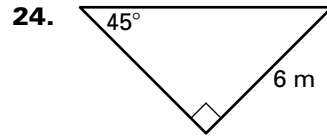
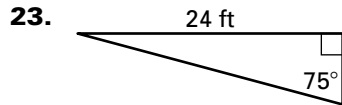
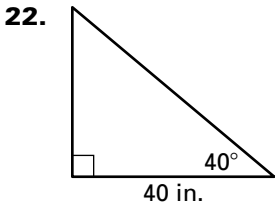
Practice A *continued*

For use with pages 484–490

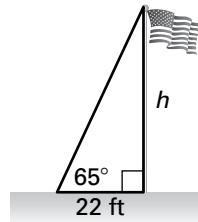
Find the area of the triangle. Round to the nearest tenth.



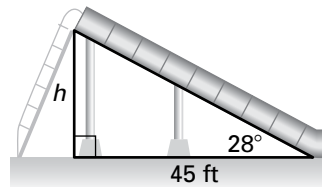
Find the perimeter of the triangle. Round to the nearest tenth.



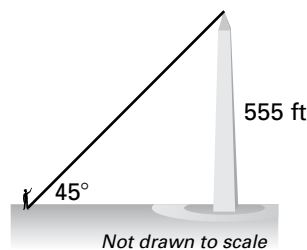
25. **Flagpole** To calculate the height h of a flagpole, you move 22 feet from the base and record the angle of elevation to the top to be 65° . Find the flagpole's height to the nearest foot.



26. **Water Slide** The angle of elevation from the base to the top of a water slide is about 28° . The horizontal length of the slide is about 45 feet. Find the height h of the slide.



27. **Distance** You are standing near the Washington Monument which is 555 feet tall. The angle of elevation from your position to the top of the monument is 45° . How far are you from the monument?

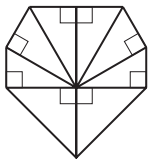


Lesson 7.4, continued

c. $d = \sqrt{\ell^2 + w^2 + h^2}$; From the equations above, let $\ell = AC$, $w = BC$, $b = AB$, and $h = AD$, where b is the length of the diagonal of the base. Rewrite the first equation given as $b = \sqrt{\ell^2 + w^2}$. Rewrite the second equation as $d = \sqrt{b^2 + h^2}$. Substitute for b in the second equation to obtain

$$\begin{aligned} d &= \sqrt{b^2 + h^2} \\ &= \sqrt{(\sqrt{\ell^2 + w^2})^2 + h^2} \\ &= \sqrt{\ell^2 + w^2 + h^2}. \end{aligned}$$

Challenge Practice

1. Yes; *Sample answer:*  2. 5.46

3. 4 points; (1, 1), (1, -1), (-1, 1), (-1, -1)

4. The shortest leg of the 30° - 60° - 90° triangle is the hypotenuse of the 45° - 45° - 90° triangle. The hypotenuse of the 45° - 40° - 90° triangle is $x\sqrt{2}$. Using 30° - 60° - 90° triangle properties, the length y is equal to two times the shortest leg of the 30° - 60° - 90° triangle. $y = 2 \cdot x\sqrt{2} = 2x\sqrt{2}$. As long as x is an integer, $2x\sqrt{2}$ will always be irrational, so y can never be an integer.

5. $VW \approx 2.54$, $VX \approx 9.80$, $WX \approx 9.46$

6. $BC = \frac{1}{2}$, $BD \approx 1.8$

Lesson 7.5

Practice Level A

1. $\tan A = \frac{3}{4} = 0.75$, $\tan B = \frac{4}{3} = 1.3333$
 2. $\tan A = \frac{21}{20} = 1.05$, $\tan B = \frac{20}{21} = 0.9524$
 3. $\tan A = \frac{5}{12} = 0.4167$, $\tan B = \frac{12}{5} = 2.4$
 4. $\tan A = \frac{24}{7} = 3.4286$, $\tan B = \frac{7}{24} = 0.2917$
 5. $\tan A = \frac{45}{28} = 1.6071$, $\tan B = \frac{28}{45} = 0.6222$
 6. $\tan A = \frac{8}{15} = 0.5333$, $\tan B = \frac{15}{8} = 1.875$
 7. 8.7 8. 22 9. 16.8 10. 42.8 11. 25
 12. 20.6 13. 5; 5 14. 6; 6 15. 6; 6 16. 10.1
 17. 35.8 18. 60 19. 86.6 cm^2 20. 68.6 ft^2

21. 333.1 in.^2 22. 125.8 in. 23. 55.3 ft
 24. 20.5 m 25. 47 ft 26. 24 ft 27. 555 ft

Practice Level B

1. $\tan A = 1.6071$, $\tan B = 0.6222$
 2. $\tan A = 1.6970$, $\tan B = 0.5893$
 3. $\tan A = 0.75$, $\tan B = 1.3333$ 4. 10.9
 5. 20.2 6. 13.9 7. 47.0 8. 31.1 9. 110.8
 10. $5\sqrt{2}$; $5\sqrt{2}$ 11. 12; 12 12. 25; 25 13. $\frac{\sqrt{3}}{3}$
 14. 1 15. $\sqrt{3}$ 16. 8.3 17. 38.6 18. 22.5
 19. 72.1 m^2 20. 180.0 ft^2 21. 1186.0 in.^2
 22. 145.2 in. 23. 81.7 ft 24. 215.5 ft
 25. a. 433 ft b. 631 ft c. 814 ft 26. 80 ft
 27. 598 ft

Practice Level C

1. 10.2 2. 14.4 3. 17.1 4. 42.2 5. 64.2
 6. 37.2 7. $\frac{7\sqrt{2}}{2}$; $\frac{7\sqrt{2}}{2}$ 8. $4\sqrt{6}$; $4\sqrt{6}$
 9. $\frac{5\sqrt{21}}{3}$; $\frac{5\sqrt{21}}{3}$ 10. 12.7 11. 21.7 12. 17.7
 13. 39.3 cm^2 14. 159.6 ft^2 15. 924.1 in.^2
 16. 137.3 in. 17. 25.4 ft 18. 95.5 m 19. about
 51.96 in. 20. 18.7 21. 70.9 ft 22. 84.5 ft
 23. Longer; as the sun sets the angle decreases and the tangent of the angle also decreases. The height of the lighthouse is constant so the shadow has to lengthen for the ratio to get smaller.
 24. $h = x(\tan 62^\circ)$; $h = (x + 16)(\tan 45^\circ)$
 25. 34.2 ft 26. 875 ft

Review for Mastery

1. $\tan A \approx 0.9524$; $\tan B = 1.05$
 2. $\tan A \approx 5.4545$; $\tan B \approx 0.1833$ 3. 68.6
 4. 17.4
 5. $x = 3\sqrt{3}$; $x \approx 5.2$; the results are the same.

Problem Solving Workshop: Using Alternative Methods

1. 90 ft 2. 46 ft

Challenge Practice

1. $\tan x^\circ = \frac{a}{b}$; $\tan(90^\circ - x^\circ) = \frac{b}{a}$
 2. They are reciprocals of each other.