NAME _____ DATE _____ PERIOD _____

8-1 Skills Practice
Geometric Mean

Find the geometric mean between each pair of numbers.

1. 2 and 8

2. 9 and 36

3. 4 and 7

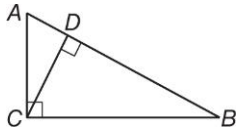
4. 5 and 10

5. 28 and 14

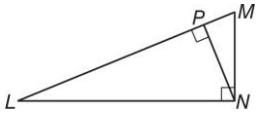
6. 7 and 36

Write a similarity statement identifying the three similar triangles in the figure.

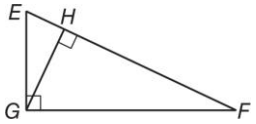
7.



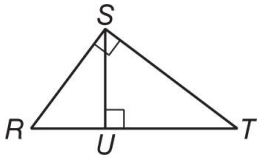
8.



9.

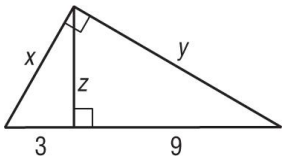


10.

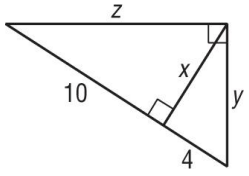


Find *x*, *y* and *z*.

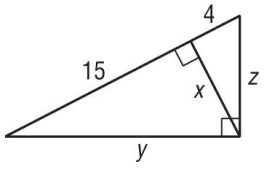
11.



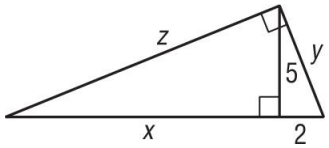
12.



13.



14.



NAME _____ DATE _____ PERIOD _____

8-1 Practice
Geometric Mean

Find the geometric mean between each pair of numbers.

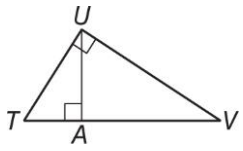
1. 8 and 12

2. 3 and 15

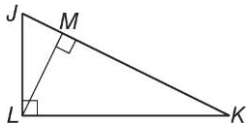
3. $\frac{4}{5}$ and 2

Write a similarity statement identifying the three similar triangles in the figure.

4.

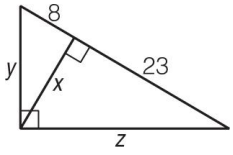


5.

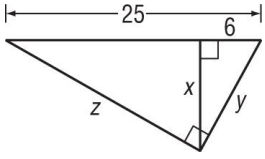


Find *x*, *y*, and *z*.

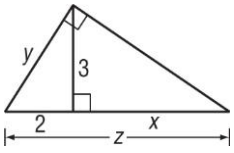
6.



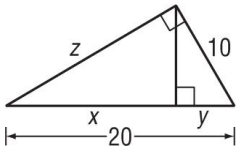
7.



8.



9.



10. CIVIL An airport, a factory, and a shopping center are at the vertices of a right triangle formed by three highways. The airport and factory are 6.0 miles apart. Their distances from the shopping center are 3.6 miles and 4.8 miles, respectively. A service road will be constructed from the shopping center to the highway that connects the airport and factory. What is the shortest possible length for the service road? Round to the nearest hundredth.

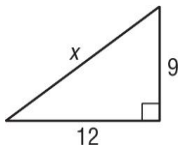
NAME _____ DATE _____ PERIOD _____

8-2 Skills Practice

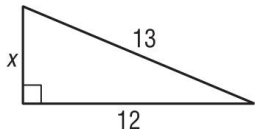
The Pythagorean Theorem and Its Converse

Find *x*.

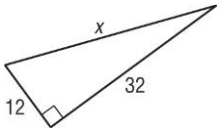
1.



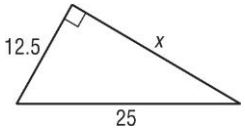
2.



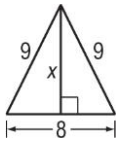
3.



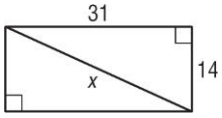
4.



5.

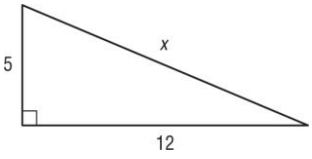


6.

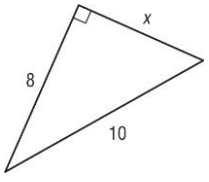


Use a Pythagorean Triple to find *x*.

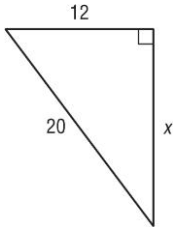
7.



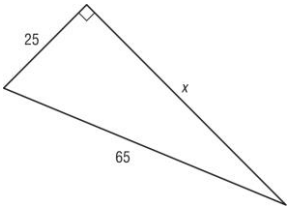
8.



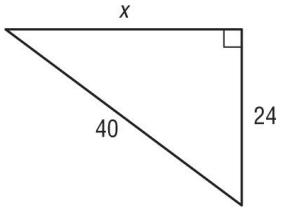
9.



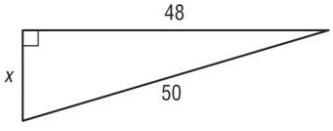
10.



11.



12.



Determine whether each set of numbers can be measure of the sides of a triangle. If so, classify the triangle as *acute, obtuse, or right*. Justify your answer.

13. 7, 24, 25

14. 8, 14, 20

15. 12.5, 13, 26

16. $3\sqrt{2}$, $\sqrt{7}$, 4

17. 20, 21, 29

18. 32, 35, 70

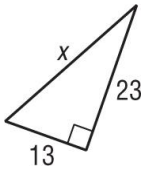
NAME _____ DATE _____ PERIOD _____

8-2 Practice

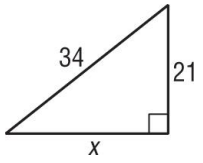
The Pythagorean Theorem and Its Converse

Find *x*.

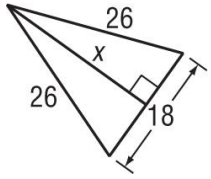
1.



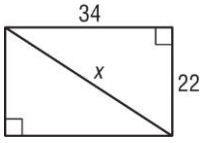
2.



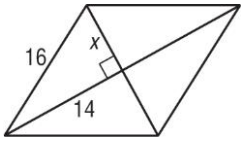
3.



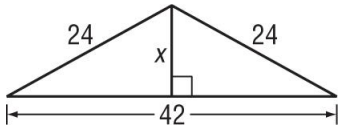
4.



5.

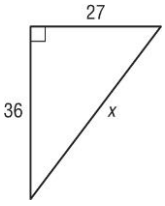


6.

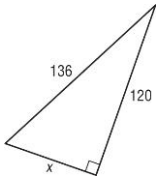


Use a Pythagorean Triple to find *x*.

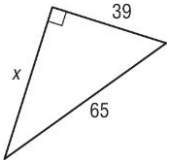
7.



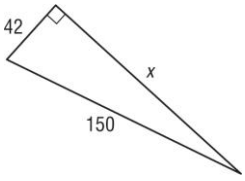
8.



9.



10.



Determine whether each set of numbers can be the measures of the sides of a triangle. If so, classify the triangle as *acute, obtuse, or right*. Justify your answer.

11. 10, 11, 20

12. 12, 14, 49

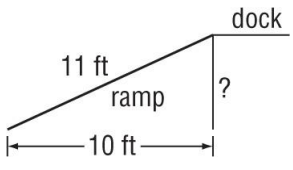
13. $5\sqrt{2}$, 10, 11

14. 21.5, 24, 55.5

15. 30, 40, 50

16. 65, 72, 97

17. CONSTRUCTION The bottom end of a ramp at a warehouse is 10 feet from the base of the main dock and is 11 feet long. How high is the dock?

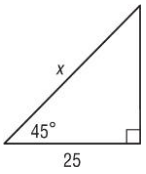


NAME _____ DATE _____ PERIOD _____

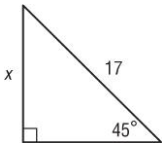
8-3 Skills Practice
Special Right Triangles

Find *x*.

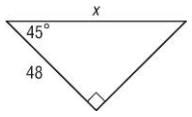
1.



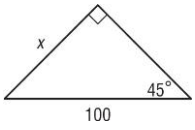
2.



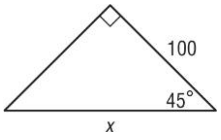
3.



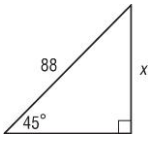
4.



5.



6.

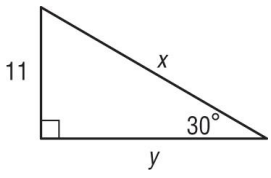


7. Determine the length of the leg of 45°-45°-90° triangle with a hypotenuse length of 26.

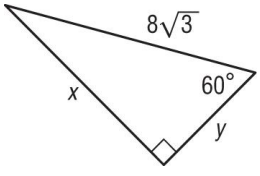
8. Find the length of the hypotenuse of a 45°-45°-90° triangle with a leg length of 50 centimeters.

Find *x* and *y*.

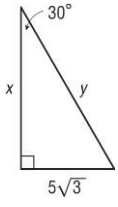
9.



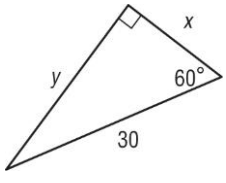
10.



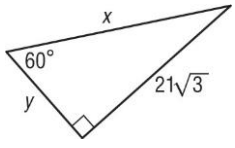
11.



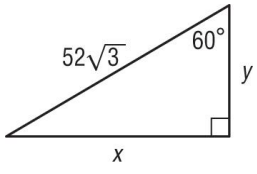
12.



13.



14.



15. An equilateral triangle has an altitude length of 27 feet. Determine the length of a side of the triangle.

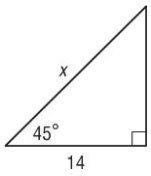
16. Find the length of the side of an equilateral triangle that has an altitude length of $11\sqrt{3}$ feet.

NAME _____ DATE _____ PERIOD _____

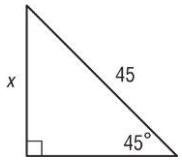
8-3 Practice
Special Right Triangles

Find *x*.

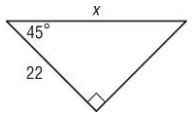
1.



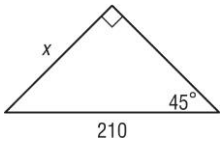
2.



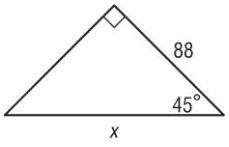
3.



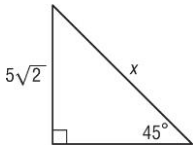
4.



5.

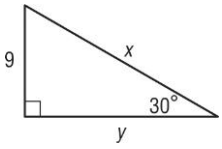


6.

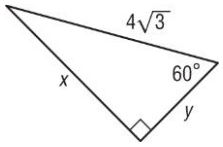


Find *x* and *y*.

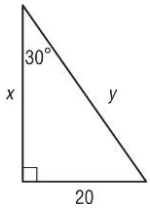
7.



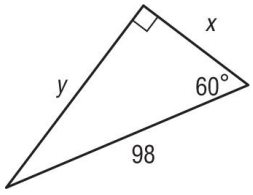
8.



9.



10.

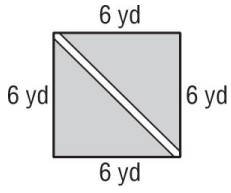


11. Determine the length of the leg of 45°–45°–90° triangle with a hypotenuse length of 38.

12. Find the length of the hypotenuse of a 45°–45°–90° triangle with a leg length of 77 centimeters.

13. An equilateral triangle has an altitude length of 33 feet. Determine the length of a side of the triangle.

14. BOTANICAL GARDENS One of the displays at a botanical garden is an herb garden planted in the shape of a square. The square measures 6 yards on each side. Visitors can view the herbs from a diagonal pathway through the garden. How long is the pathway?



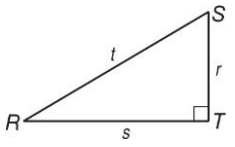
NAME _____ DATE _____ PERIOD _____

8-4 Skills Practice
Trigonometry

Find sin *R*, cos *R*, tan *R*, sin *S*, cos *S*, and tan *S*. Express each ratio as a fraction and as a decimal to the nearest hundredth if necessary.

1. $r = 16$, $s = 30$, $t = 34$

2. $r = 10$, $s = 24$, $t = 26$



Use a special right triangle to express each trigonometric ratio as a fraction and as a decimal to the nearest hundredth if necessary.

3. sin 30°

4. tan 45°

5. cos 60°

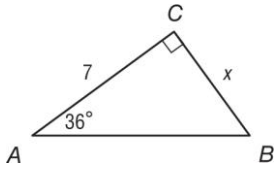
6. sin 60°

7. tan 30°

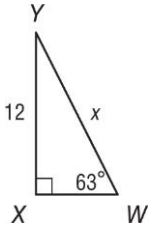
8. cos 45°

Find *x*. Round to the nearest hundredth if necessary.

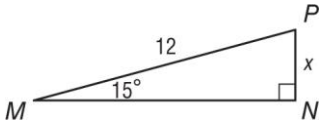
9.



10.

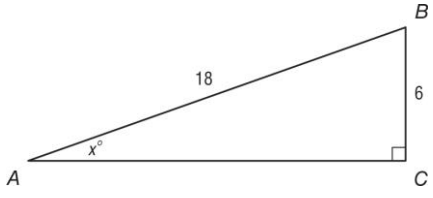


11.

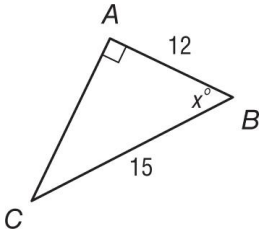


Use a calculator to find the measure of $\angle B$ to the nearest tenth.

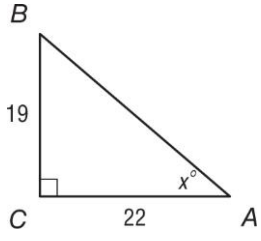
12.



13.



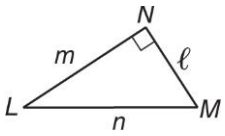
14.



NAME _____ DATE _____ PERIOD _____

8-4 Practice
Trigonometry

Find sin *L*, cos *L*, tan *L*, sin *M*, cos *M*, and tan *M*. Express each ratio as a fraction and as a decimal to the nearest hundredth if necessary.

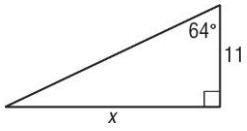


1. $\ell = 15$, $m = 36$, $n = 39$

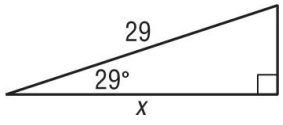
2. $\ell = 12$, $m = 12\sqrt{3}$, $n = 24$

Find *x*. Round to the nearest hundredth.

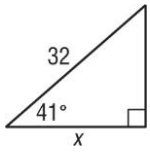
3.



4.

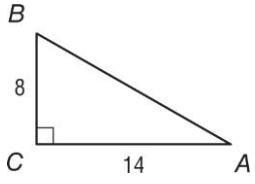


5.

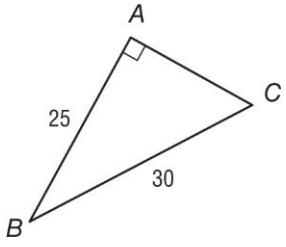


Use a calculator to find the measure of $\angle B$ to the nearest tenth.

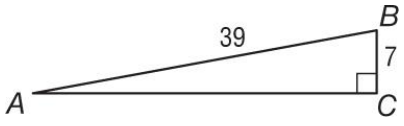
6.



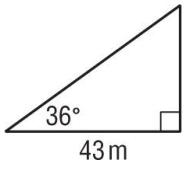
7.



8.



9. GEOGRAPHY Diego used a theodolite to map a region of land for his class in geomorphology. To determine the elevation of a vertical rock formation, he measured the distance from the base of the formation to his position and the angle between the ground and the line of sight to the top of the formation. The distance was 43 meters and the angle was 36°. What is the height of the formation to the nearest meter?



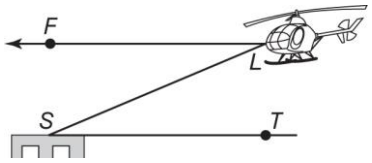
NAME _____ DATE _____ PERIOD _____

8-5 Skills Practice

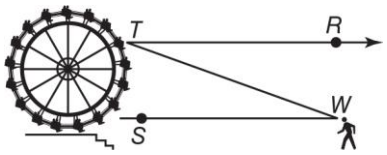
Angles of Elevation and Depression

Name the angle of depression or angle of elevation in each figure.

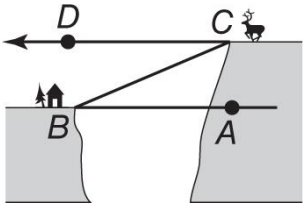
1.



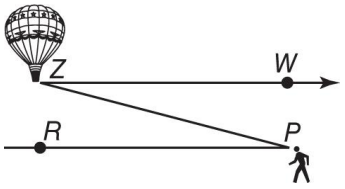
2.



3.

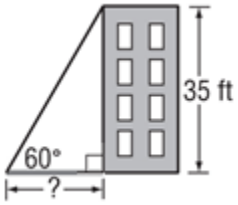


4.

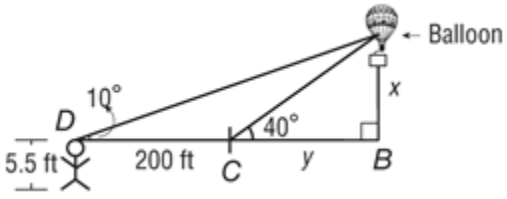


5. MOUNTAIN BIKING On a mountain bike trip along the Gemini Bridges Trail in Moab, Utah, Nabuko stopped on the canyon floor to get a good view of the twin sandstone bridges. Nabuko is standing about 60 meters from the base of the canyon cliff, and the natural arch bridges are about 100 meters up the canyon wall. If her line of sight is 5 metres above the ground, what is the angle of elevation to the top of the bridges? Round to the nearest tenth degree.

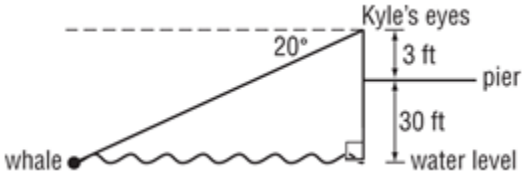
6. SHADOWS Suppose the sun casts a shadow off a 35-foot building. If the angle of elevation to the sun is 60°, how long is the shadow to the nearest tenth of a foot?



7. BALLOONING Angie sees a hot air balloon in the sky from her spot on the ground. The angle of elevation from Angie to the balloon is 40°. If she steps back 200 feet, the new angle of elevation is 10°. If Angie is 5.5 feet tall, how far off the ground is the hot air balloon?



8. INDIRECT MEASUREMENT Kyle is at the end of a pier 30 feet above the ocean. His eye level is 3 feet above the pier. He is using binoculars to watch a whale surface. If the angle of depression of the whale is 20°, how far is the whale from Kyle's binoculars? Round to the nearest tenth foot

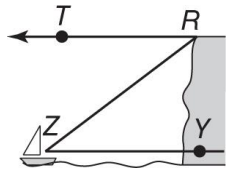


NAME _____ DATE _____ PERIOD _____

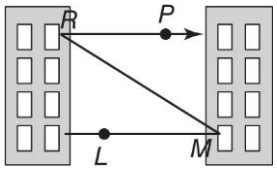
8-5 Practice
Angles of Elevation and Depression

Name the angle of depression or angle of elevation in each figure

1.



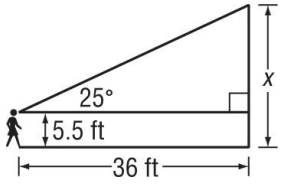
2.



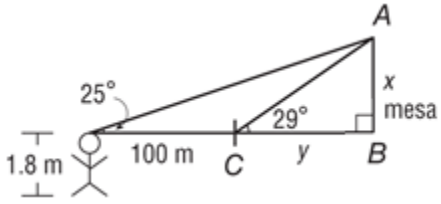
3. WATER TOWERS A student can see a water tower from the closest point of the soccer field at San Lobos High School. The edge of the soccer field is about 110 feet from the water tower and the water tower stands at a height of 32.5 feet. What is the angle of elevation if the eye level of the student viewing the tower from the edge of the soccer field is 6 feet above the ground? Round to the nearest tenth.

4. CONSTRUCTION A roofer props a ladder against a wall so that the top of the ladder reaches a 30-foot roof that needs repair. If the angle of elevation from the bottom of the ladder to the roof is 55°, how far is the ladder from the base of the wall? Round your answer to the nearest foot.

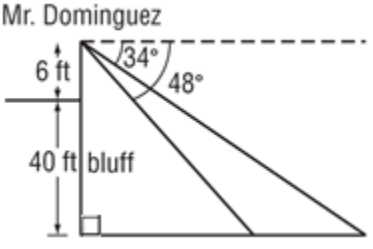
5. TOWN ORDINANCES The town of Belmont restricts the height of flagpoles to 25 feet on any property. Lindsay wants to determine whether her school is in compliance with the regulation. Her eye level is 5.5 feet from the ground and she stands 36 feet from the flagpole. If the angle of elevation is about 25°, what is the height of the flagpole to the nearest tenth?



6. GEOGRAPHY Stephan is standing on the ground by a mesa in the Painted Desert. Stephan is 1.8 meters tall and sights the top of the mesa at 29°. Stephan steps back 100 meters and sights the top at 25°. How tall is the mesa?



7. INDIRECT MEASUREMENT Mr. Dominguez is standing on a 40-foot ocean bluff near his home. He can see his two dogs on the beach below. If his line of sight is 6 feet above the ground and the angles of depression to his dogs are 34° and 48°, how far apart are the dogs to the nearest foot?



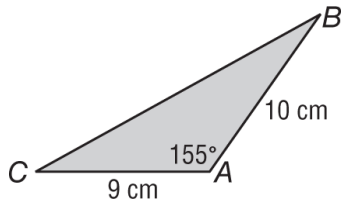
NAME _____ DATE _____ PERIOD _____

8-6 Skills Practice

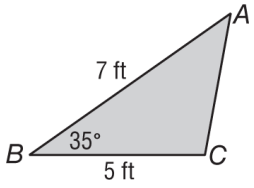
The Law of Sines

Find the area of $\triangle ABC$ to the nearest tenth.

1.



2.



3. $A = 35^\circ$, $b = 3$ ft, $c = 7$ ft

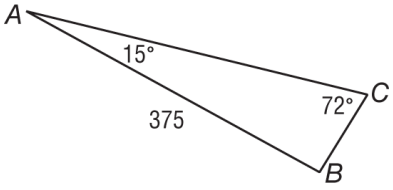
4. $C = 148^\circ$, $a = 10$ cm, $b = 7$ cm

5. $C = 22^\circ$, $a = 14$ m, $b = 8$ m

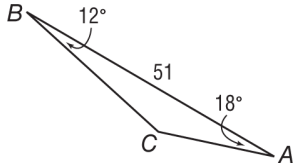
6. $B = 93^\circ$, $c = 18$ mi, $a = 42$ mi

Solve each triangle. Round side lengths to the nearest tenth and angle measures to the nearest degree.

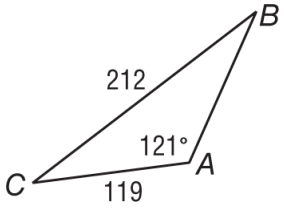
7.



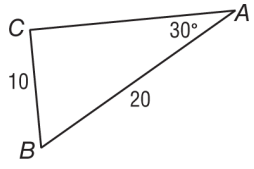
8.



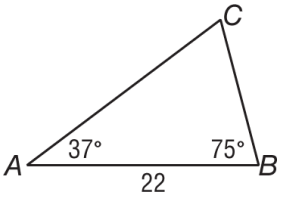
9.



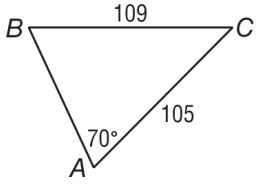
10.



11.



12.



Determine whether each triangle has *no* solution, *one* solution, or *two* solutions. Then solve the triangle. Round side lengths to the nearest tenth and angle measures to the nearest degree.

13. $A = 30^\circ$, $a = 1$, $b = 4$

14. $A = 30^\circ$, $a = 2$, $b = 4$

15. $A = 30^\circ$, $a = 3$, $b = 4$

16. $A = 38^\circ$, $a = 10$, $b = 9$

17. $A = 78^\circ$, $a = 8$, $b = 5$

18. $A = 133^\circ$, $a = 9$, $b = 7$

19. $A = 127^\circ$, $a = 2$, $b = 6$

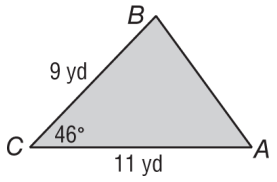
20. $A = 109^\circ$, $a = 24$, $b = 13$

NAME _____ DATE _____ PERIOD _____

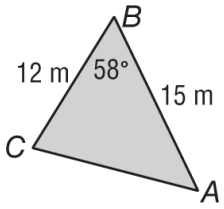
8-6 Practice
The Law of Sines

Find the area of $\triangle ABC$ to the nearest tenth.

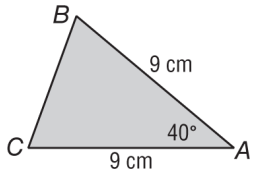
1.



2.



3.



4. $C = 32°$, $a = 12.6$ m, $b = 8.9$ m

5. $B = 27°$, $a = 14.9$ cm, $c = 18.6$ cm

6. $A = 17.4°$, $b = 12$ km, $c = 14$ km

7. $A = 34°$, $b = 19.4$ ft, $c = 8.6$ ft

Solve each triangle. Round side lengths to the nearest tenth and angle measures to the nearest degree.

8. $A = 50°$, $B = 30°$, $c = 9$

9. $A = 56°$, $B = 38°$, $a = 12$

10. $A = 80°$, $C = 14°$, $a = 40$

11. $B = 47°$, $C = 112°$, $b = 13$

12. $A = 72°$, $a = 8$, $c = 6$

13. $A = 25°$, $C = 107°$, $b = 12$

Determine whether each triangle has *no* solution, *one* solution, or *two* solutions. Then solve the triangle. Round side lengths to the nearest tenth and angle measures to the nearest degree.

14. $A = 29°$, $a = 6$, $b = 13$

15. $A = 70°$, $a = 25$, $b = 20$

16. $A = 113°$, $a = 21$, $b = 25$

17. $A = 110°$, $a = 20$, $b = 8$

18. $A = 66°$, $a = 12$, $b = 7$

19. $A = 54°$, $a = 5$, $b = 8$

20. $A = 45°$, $a = 15$, $b = 18$

21. $A = 60°$, $a = 4\sqrt{3}$, $b = 8$

22. WILDLIFE Sarah Phillips, an officer for the Department of Fisheries and Wildlife, checks boaters on a lake to make sure they do not disturb two osprey nesting sites. She leaves a dock and heads due north in her boat to the first nesting site. From here, she turns 5° north of due west and travels an additional 2.14 miles to the second nesting site. She then travels 6.7 miles directly back to the dock. How far from the dock is the first osprey nesting site? Round to the nearest tenth.

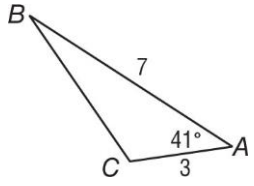
NAME _____ DATE _____ PERIOD _____

8-7 Skills Practice

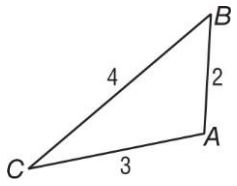
Law of Cosines

Solve each $\triangle ABC$. Round side lengths to the nearest tenth and angle measures to the nearest degree.

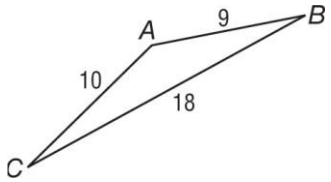
1.



2.



3.

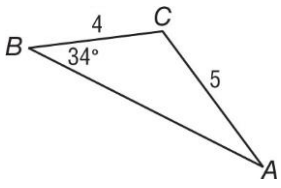


4. $C = 71^\circ$, $a = 3$, $b = 4$

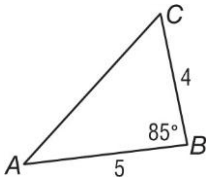
5. $C = 35^\circ$, $a = 5$, $b = 8$

Determine whether each $\triangle ABC$ should be solved by beginning with the Law of *Sines* or the Law of *Cosines*. Then solve the triangle.

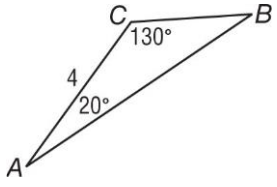
6.



7.



8.



9. $A = 11^\circ$, $C = 27^\circ$, $c = 50$

10. $B = 47^\circ$, $a = 20$, $c = 24$

11. $A = 71^\circ$, $C = 62^\circ$, $a = 20$

12. $a = 5$, $b = 12$, $c = 13$

13. $A = 51^\circ$, $b = 7$, $c = 10$

14. $a = 13$, $A = 41^\circ$, $B = 75^\circ$

15. $B = 125^\circ$, $a = 8$, $b = 14$

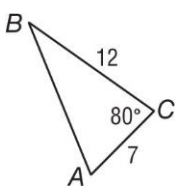
16. $a = 5$, $b = 6$, $c = 7$

NAME _____ DATE _____ PERIOD _____

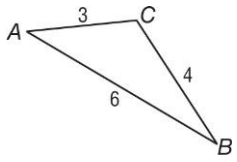
8-7 Practice
The Law of Cosines

Determine whether each $\triangle ABC$ should be solved by beginning with the Law of *Sines* or Law of *Cosines*. Then solve the triangle.

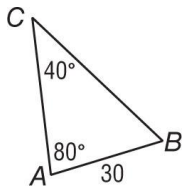
1.



2.



3.



4. $a = 16$, $b = 20$, $C = 54°$

5. $B = 71°$, $c = 6$, $a = 11$

6. $A = 37°$, $a = 20$, $b = 18$

7. $C = 35°$, $a = 18$, $b = 24$

8. $a = 8$, $b = 6$, $c = 9$

9. $A = 23°$, $b = 10$, $c = 12$

10. $a = 4$, $b = 5$, $c = 8$

11. $B = 46.6°$, $C = 112°$, $b = 13$

12. $A = 46.3°$, $a = 35$, $b = 30$

13. $a = 16.4$, $b = 21.1$, $c = 18.5$

14. $C = 43.5°$, $b = 8$, $c = 6$

15. $A = 78.3°$, $b = 7$, $c = 11$

16. SATELLITES Two radar stations 2.4 miles apart are tracking an airplane. The straight-line distance between Station *A* and the plane is 7.4 miles. The straight-line distance between Station *B* and the plane is 6.9 miles. What is the angle of elevation from Station *A* to the plane? Round to the nearest degree.

17. DRAFTING Marion is using a computer-aided drafting program to produce a drawing for a client. She begins a triangle by drawing a segment 4.2 inches long from point *A* to point *B*. From *B*, she draws a second segment that forms a 42° angle with $\overline{AB}$ and is 6.4 inches long, ending at point *C*. To the nearest tenth, how long is the segment from *C* to *A*?