

Note: Please look on Teams for Due Date.

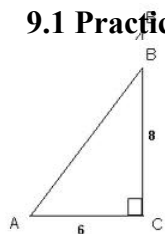
	Date	Day	Class Meeting Information	Assignment	Date Due
123 classes	4/23/2021	Friday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.1	4/28/2021
	4/26/2021	Monday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.2	4/28/2021
456 classes	4/27/2021	Tuesday	Blue: in-person Green: via Zoom (see link in Teams)	HW: 9.1	4/30/2021
	4/28/2021	Wednesday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.2	4/30/2021
123 classes	4/29/2021	Thursday	Blue: in-person Green: via Zoom (see link in Teams)	HW: 9.3	5/4/2021
	4/30/2021	Friday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.4	5/4/2021
456 classes	5/3/2021	Monday	Blue: in-person Green: via Zoom (see link in Teams)	HW: 9.3	5/6/2021
	5/4/2021	Tuesday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.4	5/6/2021
123 classes	5/5/2021	Wednesday	Blue: in-person Green: via Zoom (see link in Teams)	HW: 9.5	5/10/2021
	5/6/2021	Thursday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.6	5/10/2021
456 classes	5/7/2021	Friday	Blue: in-person Green: via Zoom (see link in Teams)	HW: 9.5	5/12/2021
	5/10/2021	Monday	Blue: via Zoom (see link in Teams) Green: in-person	HW: 9.6	5/12/2021
123 classes	5/11/2021	Tuesday	Blue: in-person Green: via Zoom (see link in Teams)	Chapter 9 Practice Test	5/12/2021
	5/12/2021	Wednesday	Blue: via Zoom (see link in Teams) Green: in-person	Chapter 9 Test	

456 classes	5/13/2021	Thursday	Blue: in-person Green: via Zoom (see link in Teams)	Chapter 9 Practice Test	5/14/2021
	5/14/2021	Friday	Blue: via Zoom (see link in Teams) Green: in-person	Chapter 9 Test	
123 classes	5/17/2021	Monday	Blue: in-person Green: via Zoom (see link in Teams)	Chapter 9 Test	
	5/18/2021	Tuesday	Blue: via Zoom (see link in Teams) Green: in-person	Semester 2 Review	
456 classes	5/19/2021	Wednesday	Blue: in-person Green: via Zoom (see link in Teams)	Chapter 9 Test	
	5/20/2021	Thursday	Blue: via Zoom (see link in Teams) Green: in-person	Semester 2 Review	

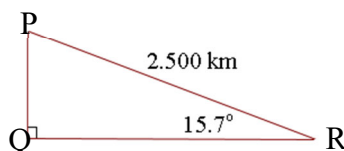
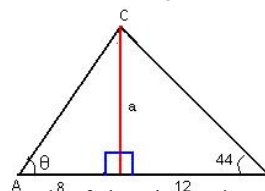
9.1 Practice: Round to four decimal places

For #1 – 2, solve each right triangle by finding all missing sides and angles.

1)



2)

3) Find the measure of $\angle A$ and the length of side a .

4) A surveyor is 980 feet from the base of the world's tallest fountain at Fountain Hills, Arizona. The angle of elevation to the top of the column of water is 29.7° . His measuring device is at the same level as the base of the fountain. Find the distance from the measuring device to the top of the fountain.

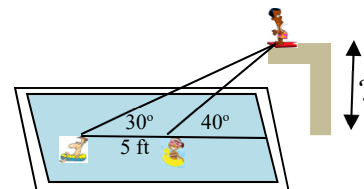
5) A weather balloon is 1503 meters away from a meteorologist. If the angle of depression is 41.2° , then find the height of the weather balloon.

6) An airplane has an altitude of 32,000 feet and is 134 miles away from its destination, which is at sea level.

Find the

angle of elevation from the destination to the airplane.

7) Austin is standing on the diving board at the local pool. Two of his friends are in the water on the opposite side of the pool. If the angle of depression to one of his friends is 40 degrees, and 30 degrees to his other friend who is 5 feet farther away than the first friend, then how tall is the diving platform?



8) Simplify: $\frac{6x^2}{15x} \cdot \frac{-2x}{7x-5} \div \frac{14x^3}{-5x}$

9) Solve: $\log_2(x+5) = 3$

10) Solve: $\sqrt{2x^2 - 4x + 5} = x - 2$

11) Solve: $3^{2x+5} = 28$

12) Expand: $\ln \frac{5xy^3}{4z}$

13) Solve: $e^{-7x} = 52$

14) Find the domain, range, and end behavior:

$g(x) = \log_5(x-3)$

15) State the Domain and Range of the function: $y = 2^x + 1$ A. Domain: all real numbers; Range: $y > 1$ B. Domain: all real numbers; Range: $y > 2$ C. Domain: $x > 2$; Range: $y > 0$ D. Domain: $x > 1$; Range: all real numbers

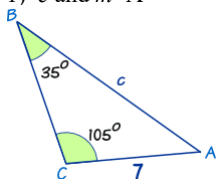
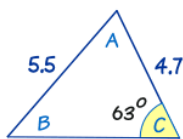
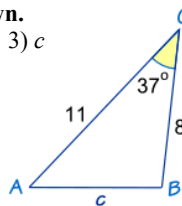
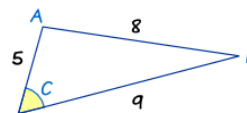
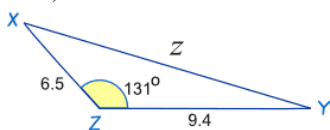
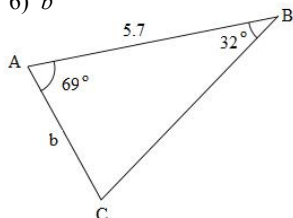
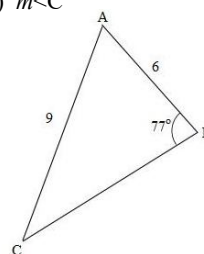
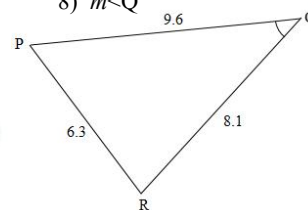
16)

Simplify: $\log_3 243 + \ln(e^{10}) - \log_5 625$

- A. -272
 B. 19
 C. 11
 D. not possible

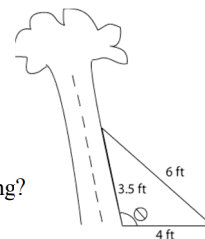
17) Solve $\sqrt{10x + 14} = 22$ **9.2 Practice**

For #1 – 8, find the requested sides or angles for the oblique triangles shown.

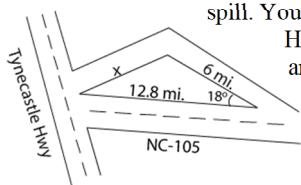
1) c and $m\angle A$ 2) $m\angle A$ and $m\angle B$ 3) c 4) $m\angle C$ 5) z 6) b 7) $m\angle C$ 8) $m\angle Q$ 

9) Radio direction finders are placed at points A and B , which are 3.46 miles apart on an east – west line, with point A west of point B . From point A , the bearing of a certain radio transmitter is 47.7° , and from point B the bearing is 32.5° . Find the distance of the transmitter from point A .

10) After the hurricane, the small tree in my neighbor's yard was leaning. To keep it from falling, we nailed a 6-foot strap into the ground 4 feet from the base of the tree. We attached the strap to the tree $3\frac{1}{2}$ feet above the ground. At what angle was the tree leaning?



11) You are heading to Beech Mountain for a ski trip. Unfortunately, state road 105 in North Carolina is blocked off due to a chemical spill. You have to get to Tynecastle Highway which leads to the resort at which you are staying. NC-105 would get you to Tynecastle Hwy in 12.8 miles. The detour begins with a 18° veer off onto a road that runs through the local city. After 6 miles, there is another turn that leads to Tynecastle Hwy. Assuming that both roads on the detour are straight, how many extra miles are you traveling to reach your destination?

12) Find the inverse function for $f(x) = -7x + 6$.

- A. $f^{-1}(x) = 7x - 6$
 B. $f^{-1}(x) = \frac{-x + 6}{7}$
 C. $f^{-1}(x) = 7x + 6$
 D. $f^{-1}(x) = \frac{x - 6}{7}$

13) State the Domain and Range of the function:

$$g(x) = 6 + \sqrt{x - 3}$$

- A. Domain: $x \geq -3$ Range: $y \geq 6$
 B. Domain: $x \geq 3$ Range: $y \geq 6$
 C. Domain: $x \geq -3$ Range: $y \geq 0$
 D. Domain: $x \geq 3$ Range: all real Numbers

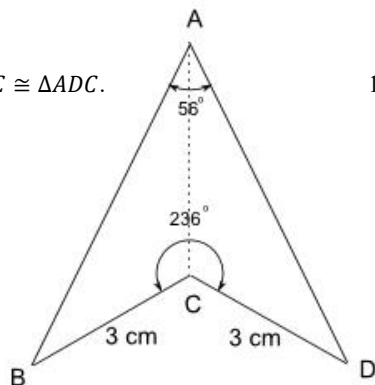
14) Solve: $\log_8(x-12) + \log_8 x = 2$

- A. $x = -4$ and $x = 16$
 B. $x = 12$
 C. $x = 16$
 D. *no solution*

15) If \$7000 is invested at a rate of 7% compounded continuously, what amount of time would be needed to have a balance of \$7700? Use the formula $A = Pe^{rt}$.

- A. $t \approx .036$
 B. $t \approx .73$
 C. $t \approx 1.36$
 D. $t \approx 15.72$

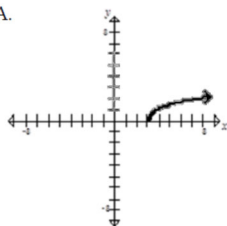
16) Find AB if $\triangle ABC \cong \triangle ADC$.



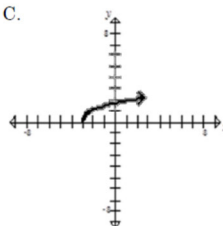
17)

Which of the following represents the graph of $y = \sqrt{x-3}$?

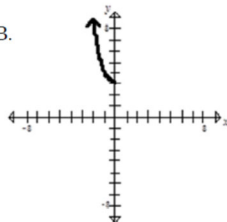
A.



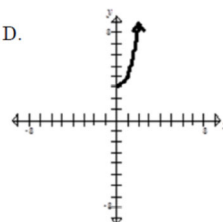
C.



B.



D.



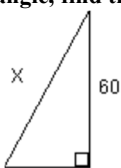
18) Condense: $6\log y - 3\log 2 + \frac{1}{2}\log 9$

19) Solve: $\sqrt{x-1} + 3 = 5$

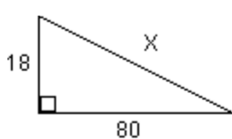
9.3 Practice

For each right triangle, find the variable(s).

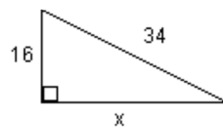
1.



2.



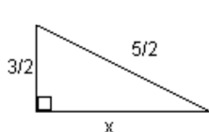
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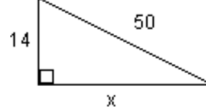
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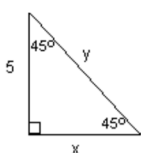
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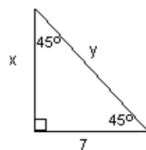
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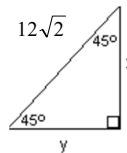
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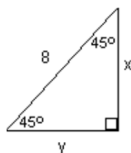
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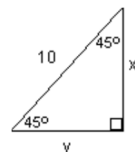
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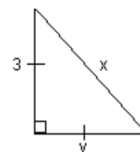
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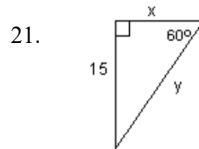
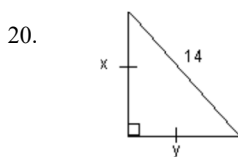
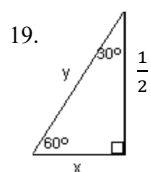
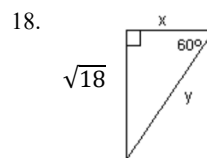
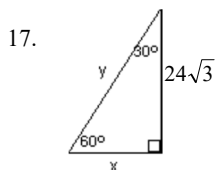
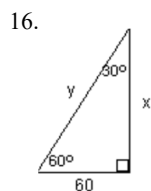
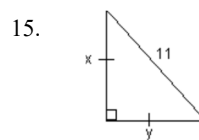
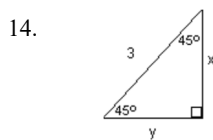
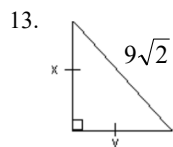


11.



12.





Simplify:

22) $8\sqrt[3]{27} + \sqrt[3]{40} - 6\sqrt[3]{135}$

- A. $24 - 16\sqrt[3]{5}$
 B. $8\sqrt[3]{5}$
 C. $8\sqrt[3]{3} - 16\sqrt[3]{5}$
 D. $2\sqrt[3]{68}$

23)

Simplify:

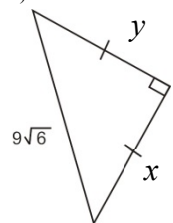
$$\frac{4^{\frac{2}{3}} \cdot 64^{\frac{2}{3}}}{4^{\frac{4}{3}}}$$

- A. $2 \cdot \sqrt[3]{2}$
 B. $32 \cdot \sqrt[3]{2}$
 C. 4
 D. $4 \cdot \sqrt[3]{4}$

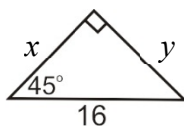
9.1 – 9.3 Quiz Review

For #1-7, find the value of each variable. No calculators.

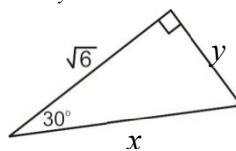
1) Find x.



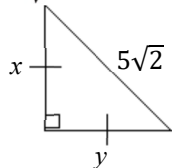
2) Find x and y.



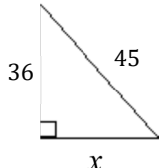
3) Find x and y.



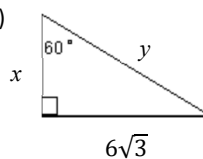
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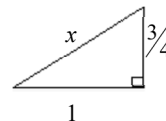
5)



6)

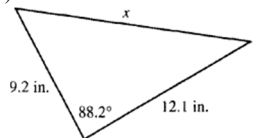


7)

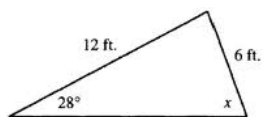


For #8 – 11: Solve each problem, and round to three decimal places. Write your answer in degrees for #11.

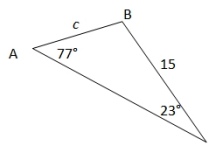
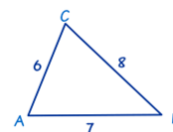
8) Find x.



9) Find x.

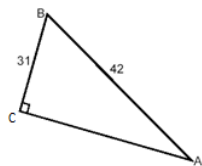


10) Find x.

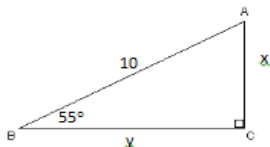
11) Find $\angle B$.

12) The tallest television transmitting tower in the world is in North Dakota, and it is 2059 feet tall. If you are on level ground exactly 5280 feet (one mile) from the base of the tower, what is your angle of elevation looking up at the top of the tower?

13) Find $\angle B$ and AC.



14) Find x and y .



15) A baseball player in center field is playing approximately 330 feet from the television camera that is behind home plate. A batter hits a fly ball that goes to the wall that is 420 feet from the camera. Approximate the number of feet the center fielder had to run to make the catch if the camera turned 9° toward the right in order to follow the play.

9.4 Practice: Note: You need to memorize the unit circle for your quiz next class!

For #1 – 14, find the requested value without using a calculator. Instead of using the completed unit circle, try to generate the appropriate portion (triangle) of the unit circle that you need. Simplify radical answers.

- 1) $\sin 60$ 2) $\tan 225$ 3) $\cos 300$ 4) $\tan 60$ 5) $\sin 135$ 6) $\cos 210$ 7) $\cos 90$
 8) $\cos 135$ 9) $\tan 270$ 10) $\tan 360$ 11) $\sin 330$ 12) $\cos 30$ 13) $\sin 180$ 14) $\sin 30$

For #15 – 18, find the missing angle(s) that satisfy the equation. Use angle measures between 0 and 360 degrees.

- 15) $\sin \theta = \frac{\sqrt{2}}{2}$ 16) $\tan \theta = -1$ 17) $\cos \theta = -\frac{1}{2}$ 18) $\tan \theta = \text{undefined}$

19) Simplify completely: $-3(2x^4y^{-5})^3(-4x^{-9}y^{-2})^{-2}$ 20) Solve: $e^{4x-5} = 3$ 21) Condense: $\log_3 2 - \log_3 7 - 2\log_3 b + 5\log_3 a$

22) Simplify completely, and identify the domain: $\frac{x^2-4x-12}{3x^2+3x-6} \div \frac{2x^2-72}{x+5}$ 23) $\frac{2^{2/3} \cdot 8^{1/3}}{4^{1/3}}$

24) Consider the angle 30° . Does the following equation work for this angle? $\sin^2 + \cos^2 = 1$ Why do you suspect you get the result that you do?

25) Consider the angle 45° . Does the following equation work for this angle? $\sin^2 + \cos^2 = 1$ Why do you suspect you get the result that you do?

9.5 Practice

For #1 – 6, convert each angle from degrees to radians or radians to degrees. Write any radian answers as simplified fractions in terms of pi.

- 1) 320° 2) $\frac{\pi}{4}$ 3) $\frac{5\pi}{3}$ 4) 135° 5) π 6) $\frac{5\pi}{6}$

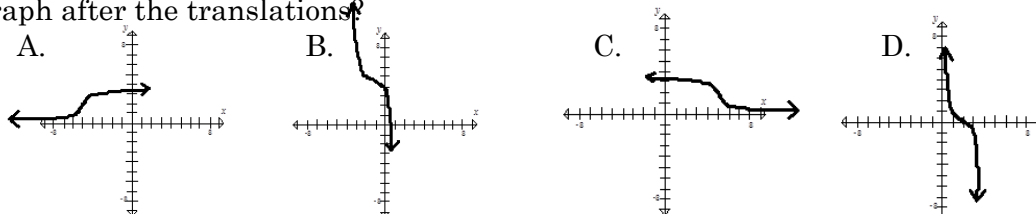
For #7 – 12, find the requested values.

- 7) $\sin \frac{2\pi}{3}$ 8) $\tan \frac{\pi}{6}$ 9) $\cos \frac{3\pi}{4}$ 10) $\tan \frac{\pi}{2}$ 11) $\sin 2\pi$
 12) $\cos \frac{11\pi}{6}$

For #13 – 18, find one positive coterminal angle (that is less than 360 degrees or 2π) for each standard positional angle below.

- 13) 460° 14) $-\frac{\pi}{3}$ 15) -125° 16) $\frac{17\pi}{6}$ 17) $\frac{22\pi}{4}$ 18) 730°

19) Translate the graph of $f(x) = \sqrt[3]{x}$ two (2) units up and five (5) units left. Which of the following is the graph after the translations?



20) State the Domain and Range of the function: $y = 3^x + 2$

21) Solve: $\sqrt{x+8} = x+2$

9.6 Practice**For #1 – 4, find the requested values, given $\sin \theta = \frac{8}{17}$. No calculators.**

1) $\sec \theta$

2) $\cot \theta$

3) $\csc \theta$

4) $\tan \theta$

For #5 – 8, find the requested values, given $\csc \theta = \frac{25}{24}$. No calculators.

5) $\cot \theta$

6) $\cos \theta$

7) $\sin \theta$

8) $\tan \theta$

For #7 – 12, find the requested values, given $\tan \theta = \frac{7}{5}$. No calculators. Simplify radical answers.

9) $\cos \theta$

10) $\cot \theta$

11) $\csc \theta$

12) $\sec \theta$

For #13 – 18, find the requested values, given $\cot \theta = -\sqrt{3}$, and $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$. No calculators.

13) $\sin \theta$

14) $\sec \theta$

15) $\csc \theta$

16) $\tan \theta$

17) $\cos \theta$

18) θ

19) Identify any asymptotes and holes: $f(x) = \frac{x-3}{x^2+4x-21}$

20) Solve: $\sqrt{4x-8} = 5$

21)

What point on the unit circle does the terminal side of an angle of $\frac{11\pi}{6}$ pass through?

A. $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

B. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

C. $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

D. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

Unit 9 Practice Test**For #1 – 15, find requested values. Exact answers only. No calculators.**

1) $\sin \frac{5\pi}{6}$

2) $\cos 315^\circ$

3) $\tan\left(-\frac{\pi}{3}\right)$

4) $\csc 120^\circ$

5) $\sec(-120^\circ)$

6) $\sin \frac{4\pi}{3}$

7) $\cot \frac{5\pi}{4}$

8) $\csc(\pi)$

9) $\cos \frac{11\pi}{6}$

10) $\tan \frac{5\pi}{6}$

11) $\sec\left(-\frac{5\pi}{4}\right)$

12) $\cot(240^\circ)$

13) $\csc \frac{7\pi}{6}$

14) $\cos \frac{2\pi}{3}$

15) $\csc(-60^\circ)$

For #16 – 18, given that $\sin x = \frac{24}{25}$, find the requested values (exact answers only). No calculators.

16) $\sec x$

17) $\cot x$

18) $\cos x$

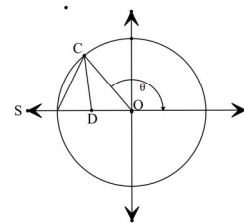
For #19 – 21, given that $\tan x = 5$, find the requested values (exact answers only). No calculators.

19) $\sin x$

20) $\csc x$

21) $\cos x$

22) A unit circle is drawn to the right, where $\theta = \frac{3\pi}{4}$ and Point D is the midpoint of $\overline{OS}$. Find the



9.1 Practice Answers

- 1) $AB = 10$, $\angle A = 53.1301^\circ$, $\angle B = 36.8699^\circ$ 2) $\angle P = 74.3^\circ$, $PQ = 0.6765$ km, $QR = 2.4067$ km 3) $a = 11.5883$, $\angle A = 55.3807^\circ$
- 4) 1128.2114 ft 5) 990.0103 m 6) 2.5923° 7) 9.2542 ft 8) $\frac{2x^5}{49}$ 9) 3
- 10) $\pm i$ 11) -0.9834 12) $\ln 5 + \ln x + 3\ln y - \ln 4 - \ln z$ 13) -0.5645
- 14) Domain: $x > 3$; Range: all real #, as $x \rightarrow \infty$, $f(x) \rightarrow \infty$ 15) A 16) C 17) $x = 47$

9.2 Practice Answers

- 1) $\angle A = 40^\circ$; $c = 11.78828$ 2) $\angle A = 67.4117^\circ$; $\angle B = 49.5883^\circ$ 3) 6.6663 4) 62.1819° 5) 14.5183
- 6) 3.0771 7) 40.5099° 8) 40.6011° 9) 1.8866 10) 106.07° (so 16.07 degrees past vertical)
- 11) 0.532 extra miles for the detour 12) B 13) B 14) C 15) C
- 16) 5.6422 17) A 18) $\log \frac{3y^6}{8}$ 19) $x = 5$

9.3 Practice Answers

- 1) 65 2) 82 3) 30 4) 39 5) 2 6) 48
- 7) $x = 5$, $y = 5\sqrt{2}$ 8) $x = 7$, $y = 7\sqrt{2}$ 9) $x = 12$, $y = 12$ 10) $x = y = 4\sqrt{2}$
- 11) $x = y = 5\sqrt{2}$ 12) $x = 3\sqrt{2}$; $y = 3$ 13) $x = y = 9$ 14) $x = y = \frac{3\sqrt{2}}{2}$
- 15) $x = y = \frac{11\sqrt{2}}{2}$ 16) $y = 120$; $x = 60\sqrt{3}$ 17) $x = 24$; $y = 48$ 18) $x = \sqrt{6}$; $y = 2\sqrt{6}$
- 19) $x = \frac{\sqrt{3}}{6}$; $y = \frac{\sqrt{3}}{3}$ 20) $x = 7\sqrt{2}$, $y = 7\sqrt{2}$ 21) $x = 5\sqrt{3}$; $y = 10\sqrt{3}$ 22) A 23) D

9.1-9.3 Quiz Review Answers

- 1) $x = y = 9\sqrt{3}$ 2) $x = y = 8\sqrt{2}$ 3) $x = 2\sqrt{2}$, $y = \sqrt{2}$ 4) $x = y = 5$ 5) 27 6) $x = 6$, $y = 12$ 7) $\frac{5}{4}$
- 8) 14.969° 9) 69.875° 10) 6.015 11) 46.567° 12) 21.304°
- 13) $\angle B = 42.431^\circ$, $AC = 28.337$ 14) $x = 8.192$, $y = 5.736$ 15) 107.298 feet

9.4 Practice Answers

- 1) $\frac{\sqrt{3}}{2}$ 2) 1 3) $\frac{1}{2}$ 4) $\sqrt{3}$ 5) $\frac{\sqrt{2}}{2}$ 6) $-\frac{\sqrt{3}}{2}$ 7) 0 8) $-\frac{\sqrt{2}}{2}$ 9) Undefined 10) 0 11) $-\frac{1}{2}$
- 12) $\frac{\sqrt{3}}{2}$ 13) 0 14) $\frac{1}{2}$ 15) 45 or 135 16) 135 or 315 17) 120 or 240 18) 90 or 270 19) $-\frac{3x^{30}}{2y^{11}}$
- 20) 1.5247 21) $\log_3 \frac{2a^5}{7b^2}$ 22) $\frac{x+5}{6(x-1)(x+6)}$ 23) 2

24) Yes, the triangle is a right triangle, and so the Pythagorean Theorem works. Since one leg's length is $\cos$, and the other leg's length is $\sin$, and the hypotenuse in a unit circle has a value of 1, this equation is equivalent to $a^2 + b^2 = c^2$.

25) Same answer as #24.

9.5 Answers

- 1) $\frac{16\pi}{9}$ 2) 45 degrees 3) 300 degrees 4) $\frac{3\pi}{4}$ 5) 180 degrees 6) 150 degrees 7) $\frac{\sqrt{3}}{2}$
- 8) $\frac{\sqrt{3}}{3}$ 9) $-\frac{\sqrt{2}}{2}$ 10) undefined 11) 0 12) $\frac{\sqrt{3}}{2}$ 13) 100 degrees 14) $\frac{5\pi}{3}$
- 15) 235° 16) $\frac{5\pi}{6}$ 17) $\frac{3\pi}{2}$ 18) 10° 19) A 20) Domain: all real #s; Range: $y > 2$
- 21) 1

9.6 Answers

- 1) $\frac{17}{15}$ 2) $\frac{15}{8}$ 3) $\frac{17}{8}$ 4) $\frac{8}{15}$ 5) $\frac{7}{24}$ 6) $\frac{7}{25}$
- 7) $\frac{24}{25}$ 8) $\frac{24}{7}$ 9) $\frac{5\sqrt{74}}{74}$ 10) $\frac{5}{7}$ 11) $\frac{\sqrt{74}}{7}$ 12) $\frac{\sqrt{74}}{5}$
- 13) $-\frac{1}{2}$ 14) $\frac{2\sqrt{3}}{3}$ 15) -2 16) $-\frac{\sqrt{3}}{3}$ 17) $\frac{\sqrt{3}}{2}$ 18) $-\frac{\pi}{6}$
- 19) VA: $x = -7$; HA: $y = 0$; hole at $(3, \frac{1}{10})$ 20) $x = \frac{33}{4}$ 21) B

Unit 9 Practice Test Answers

- 1) $\frac{1}{2}$ 2) $\frac{\sqrt{2}}{2}$ 3) $-\sqrt{3}$ 4) $\frac{2\sqrt{3}}{3}$ 5) -2 6) $-\frac{\sqrt{3}}{2}$ 7) 1
- 8) undefined 9) $\frac{\sqrt{3}}{2}$ 10) $-\frac{\sqrt{3}}{3}$ 11) $-\sqrt{2}$ 12) $\frac{\sqrt{3}}{3}$ 13) -2 14) $-\frac{1}{2}$
- 15) $-\frac{2\sqrt{3}}{3}$ 16) $\frac{25}{7}$ 17) $\frac{7}{24}$ 18) $\frac{7}{25}$ 19) $\frac{5\sqrt{26}}{26}$ 20) $\frac{\sqrt{26}}{5}$ 21) $\frac{\sqrt{26}}{26}$
- 22) $-\frac{\sqrt{2}}{2}$