MAT1323 Final Exam Review SP16

Convert the angle to decimal degrees and round to the nearest hundredth of a degree.

1) 262°7′45″

Convert the angle to degrees, minutes, and seconds.

2) 95.69°

Draw the given angle in standard position. Draw an arrow representing the correct amount of rotation. Find the measure of two other angles, one positive and one negative, coterminal with the given angle.

3) 115°

Solve the problem.

4) A wheel makes 372 revolutions per minute. How many revolutions does it make per second?

Suppose that θ is in standard position and the given point is on the terminal side of θ. Give the exact value of the indicated trig function for θ.

5) (-3, 2); Find cos θ.

Evaluate the expression.

6) $8 \tan^2 360° - 2 \sin^2 180° + 9 \csc^2 270°$

Find the value of the variable in the equation.

7) $\sec(10\theta + 27°) = \dfrac{1}{\cos(13\theta - 12°)}$

Determine the signs of the given trigonometric functions of an angle in standard position with the given measure.

8) cos (489°) and tan (489°)

Identify the quadrant for the angle θ satisfying the following conditions.

9) cot $\theta < 0$ and cos $\theta > 0$

Decide whether the statement is possible or impossible.

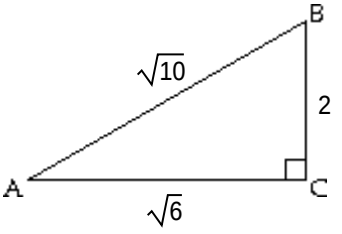
10) sec $\theta = -0.73$

Use the fundamental identities to find the value of the trigonometric function.

11) Find sin θ if cos $\theta = \dfrac{2}{5}$ and θ is in quadrant IV.

Evaluate the function requested. Write your answer as a fraction in lowest terms.

12)



Find tan A.

Write in terms of the cofunction of a complementary angle.

13) tan 76°

Find a solution for the equation. Assume that all angles are acute angles.

14) $\sin(2\beta + 10°) = \cos(3\beta - 25°)$

Give the exact trigonometric function value.

15) sec 30°

16) sec 45°

17) cot 60°

Find the reference angle for the given angle.

18) A = 263.4°

Find the exact function value .

19) cos 150°

20) csc (-120°)

Use a calculator to find the function value. Give your answer rounded to seven decimal places, if necessary.

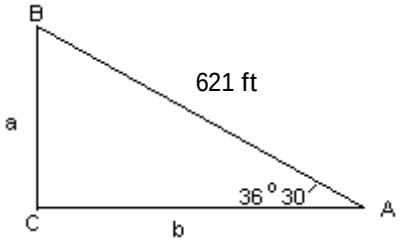
21) cot 10°45′

Find a value of θ in [0°, 90°] that satisfies the statement. Round to seven decimal places.

22) sec $\theta = 2.8686923$

Solve for the requested quantity.

23) Find b. Round to the tenths place.



Solve the right triangle.

24) a = 2.9 cm, b = 1.7 cm, C = 90°

Solve the problem.

25) From a boat on the lake, the angle of elevation to the top of a cliff is 24°46'. If the base of the cliff is 848 feet from the boat, how high is the cliff (to the nearest foot)?

26) When sitting atop a tree and looking down at his pal Joey, the angle of depression of Mack's line of sight is 37°54'. If the tree is 18 feet tall, how far is Joey standing from the base of the tree (to the nearest foot)?

27) A fire is sighted due west of lookout A. The bearing of the fire from lookout B, 8.8 miles due south of A, is 327.9°. How far is the fire from B (to the nearest tenth of a mile)?

28) Radio direction finders are set up at points A and B, 2.50 mi apart on an east-west line. From A it is found that the bearing of a signal from a transmitter is N 36°20 E, while from B it is N 53°40 W. Find the distance of the transmitter from B, to the nearest hundredth of a mile.

Convert the angle to radians. Leave your answer as a multiple of π.

29) 252°

Convert the radian measure to degrees.

30) $\frac{9\pi}{2}$

Find the exact function value.

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

32) $\cot\left(-\frac{11\pi}{6}\right)$

33) $\csc \frac{3\pi}{4}$

Find the length of an arc intercepted by a central angle θ in a circle of radius r. Round your answer to 1 decimal place.

34) r = 119.94 in.; θ = 24°

Assume that the cities lie on the same north-south line and that the radius of the earth is 6400 km.

35) Find the distance in kilometers between City A, 16° N, and City B, 24° N. (Round to the nearest whole number.)

Solve the problem.

36) Electrical wire is being wound around a drum with radius of 0.79 meters. If 2.18 m of wire is wound around the drum, through what angle (to the nearest degree) is the drum rotated?

37) Find the radius of a pulley if rotating the pulley 119.10° raises the pulley 29.0 mm.

Find the area of a sector of a circle having the given radius r and central angle θ.

38) r = 20.11 ft, θ = 23.860°

Find the exact circular function value.

39) $\sin \frac{5\pi}{4}$

40) $\tan \frac{7\pi}{6}$

41) $\sec\left(-\frac{5\pi}{3}\right)$

Use a calculator to evaluate the function.

42) tan 0.2229

Find the value of s in the interval $[0, \pi/2]$ that makes the statement true.

43) sec s = 4.1924229

Find the exact value of s in the given interval that has the given circular function value.

44) $\left[\frac{\pi}{2}, \pi\right]$; $\sin s = \frac{\sqrt{2}}{2}$

Find the amplitude and period.

45) $y = 5 \sin \frac{1}{4}x$

Graph the function.

46) $y = -4 \sin 2x$

47) $y = 3 \cos \frac{x}{2}$

Find the period.

48) $y = 5 \sin (4x - \pi)$

Find the phase shift.

49) $y = -2 \cos\left(x + \frac{\pi}{6}\right)$

Graph the function over a one-period interval.

50) $y = \cos 2(x - \frac{\pi}{3})$

Find the vertical translation.

51) $y = -1 + 7 \sin 3x$

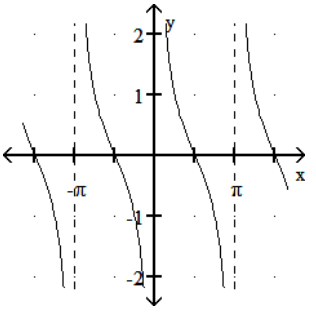
Graph the function.

52) $y = 3 + \cos 2x$

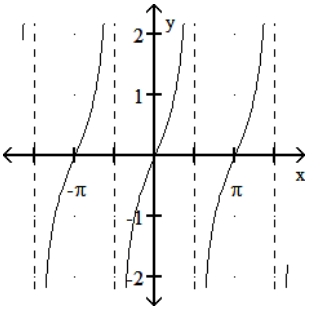
Match the function with its graph.

53) 1) $y = \tan x$ 2) $y = \cot x$

A)

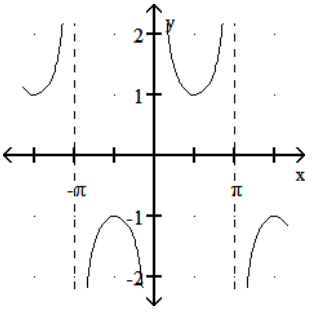


B)

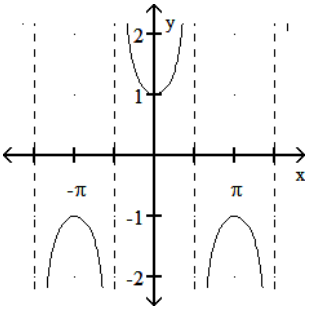


54) 1) $y = \sec x$ 2) $y = \csc x$

A)



B)



Use the fundamental identities to find the value of the trigonometric function.

55) Find csc s if cot s = $-\frac{2}{3}$ and s is in quadrant IV.

56) Find cos θ if tan $\theta = 3$ and sin $\theta < 0$.

Use the fundamental identities to find an equivalent expression involving only sines and cosines, and then simplify it.

57) sec θ + csc θ

Use the fundamental identities to simplify the expression.

58) $\sin^2\theta + \tan^2\theta + \cos^2\theta$

Verify that each equation is an identity.

59) tan x(csc x - sin x) = cos x

60) $8\csc^2\theta - 4\cot^2\theta = 4\csc^2\theta + 4$

61) $\frac{\tan x + \cot x}{\tan x - \cot x} = \frac{1}{\sin^2 x - \cos^2 x}$

62) $\frac{1 + \cos t}{1 - \cos t} - \frac{1 - \cos t}{1 + \cos t} = 4 \cot t \csc t$

Find the exact value using a sum or difference identity.

63) sin 105°

64) cos 285°

65) tan 195°

Use the identity for cosine of a difference to write the expression as a single function of x.

66) cos (x - 270°)

Use an appropriate identity to find the exact value of the expression.

67) cos 140° cos 40° - sin 140° sin 40°

68) sin 10° cos 125° + cos 10° sin 125°

69) $\frac{\tan 155° - \tan 35°}{1 + \tan 155° \tan 35°}$

Find the exact functional value.

70) If sin A = $-\frac{4}{5}$, and A terminates in quadrant IV, then find sin 2A.

Use an identity to write the expression as a single trigonometric function or as a single number.

71) 4 sin 2x cos 2x

72) $2\cos^2 22.5° - 1$

Find the exact value by using a half-angle identity.

73) sin 75°

74) tan 165°

Find the exact value by using a half-angle identity.

75) Find cos $\frac{x}{2}$, given that cos x = $\frac{1}{4}$ and x terminates in $0 < x < \pi/2$.

Find the exact value of the real number y.

76) $y = \sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$

77) $y = \arccos\left(-\frac{1}{2}\right)$

Give the degree measure of θ.

78) $\theta = \cot^{-1}(-1)$

79) $\theta = \csc^{-1}\left(-\frac{2\sqrt{3}}{3}\right)$

Evaluate the expression exactly.

80) $\cot(\sin^{-1}\frac{3}{7})$

81) $\cos(2 \arcsin\frac{1}{4})$

82) $\cos\left(\arcsin\frac{3}{5} + \arccos\frac{\sqrt{3}}{2}\right)$

Solve the equation exactly over the interval [0,360°).

83) $3\sin^2\theta - \sin\theta - 4 = 0$

Solve the equation over the interval $[0, 2\pi)$.

84) $\tan x - 5 = -6$

85) $2\sin^2 x = \sin x$

Solve the equation exactly over the interval [0,360°).

86) $(\tan\theta + 1)(2\cos\theta - 1) = 0$

87) $\sin^2\theta - \cos^2\theta = 0$

88) $\sin 2\theta = \sin\theta$

89) $\cos 2\theta = \frac{\sqrt{3}}{2}$

Solve the triangle, if possible.

90) B = 18.1°
C = 109.0°
b = 31.56 in.

91) A = 98°
b = 15.2 ft
a = 43.4 ft

92) B = 14.4°
b = 16.12 m
a = 32.41 m

93) B = 42°30'
b = 8.67 cm
a = 21.01 cm

Solve the problem.

94) An airplane is sighted at the same time by two ground observers who are 2 miles apart and both directly west of the airplane. They report the angles of elevation as 11° and 21°. How high is the airplane?

Find the missing parts of the triangle.

95) C = 114.4°
a = 5.70 km
b = 10.96 km

Solve the problem.

96) Two ships leave a harbor together traveling on courses that have an angle of 128° between them. If they each travel 522 miles, how far apart are they (to the nearest mile)?

Find the missing parts of the triangle. (Find angles to the nearest hundredth of a degree.)

97) a = 6.4 in.
b = 13.0 in.
c = 16.2 in.

Find the area of triangle ABC with the given parts. (Round to the nearest square unit.)

98) A = 25.1°
b = 10.8 in.
c = 5.5 in.

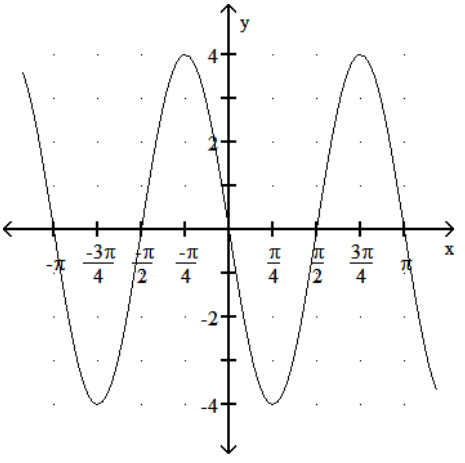
99) a = 5 ft
b = 14 ft
c = 11 ft

Solve the problem.

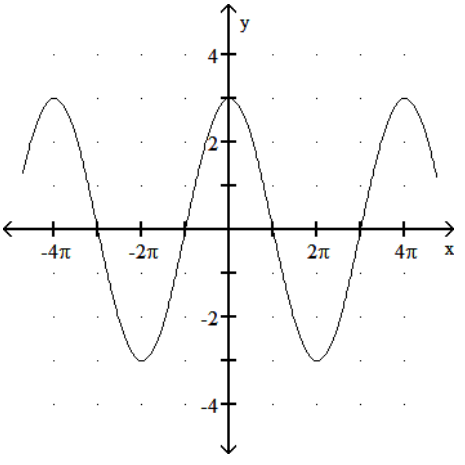
100) A painter is going to apply a special coating to a triangular metal plate on a new building. Two sides measure are 12.6 m and 5.7 m. She knows that the angle between these sides is 21.5°. What is the area of the surface she plans to cover with the coating? (Round to the nearest square meter.)

1) 262.13°
2) 95°41′24″
3) 475° and -245°

4) 6.2 revolutions per second
5) $-\frac{3\sqrt{13}}{13}$
6) 9
7) 13°
8) negative and negative
9) Quadrant IV
10) Impossible
11) $-\frac{\sqrt{21}}{5}$
12) $\tan A = \frac{\sqrt{6}}{3}$
13) cot 14°
14) $\beta = 21°$
15) $\frac{2\sqrt{3}}{3}$
16) $\sqrt{2}$
17) $\frac{\sqrt{3}}{3}$
18) 83.4°
19) $-\frac{\sqrt{3}}{2}$
20) $-\frac{2\sqrt{3}}{3}$
21) 5.2671517
22) 69.5988482°
23) b = 499.2 feet
24) A = 59.6°, B = 30.4°, c = 3.4 cm
25) 391 ft
26) 23 ft
27) 10.4 mi
28) 2.01 mi
29) $\frac{7\pi}{5}$
30) 810°
31) $-\frac{1}{2}$
32) $\sqrt{3}$
33) $\sqrt{2}$
34) 50.2 in.
35) 894 km
36) 158°
37) 13.95 mm
38) 84.21 ft^2
39) $-\frac{\sqrt{2}}{2}$
40) $\frac{\sqrt{3}}{3}$
41) 2
42) 0.2267
43) 1.32994903
44) $s = \frac{3\pi}{4}$
45) 5, 8π
46)

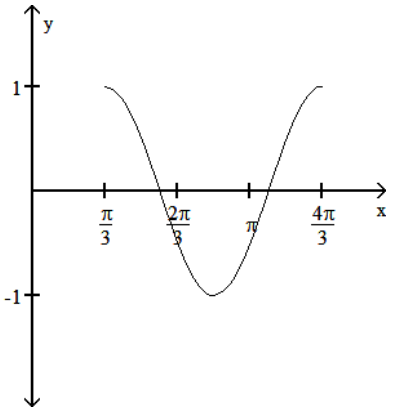


47)



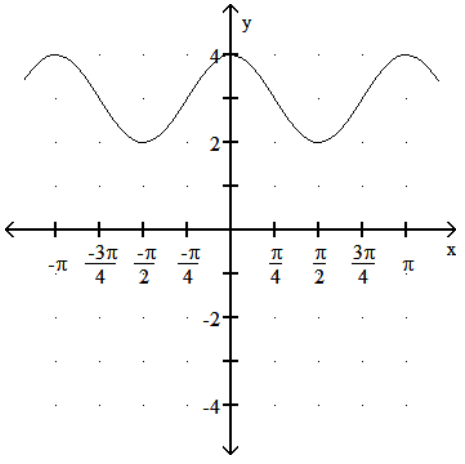
48) $\frac{\pi}{2}$
49) $\frac{\pi}{6}$ units to the left

50)



51) Down 1

52)



53) 1B, 2A

54) 1B, 2A

55) $-\frac{\sqrt{13}}{3}$

56) $-\frac{\sqrt{10}}{10}$

57) $\frac{\sin\theta + \cos\theta}{\sin\theta\cos\theta}$

58) $\sec^2\theta$

59) $\tan x(\csc x - \sin x) = \tan x \cdot \csc x - \tan x \cdot \sin x = \frac{\sin x}{\cos x} \cdot \frac{1}{\sin x} - \frac{\sin x}{\cos x} \cdot \sin x = \frac{1}{\cos x} - \frac{\sin^2 x}{\cos x} = \frac{1 - \sin^2 x}{\cos x} = \frac{\cos^2 x}{\cos x} = \cos x$

60) $8\csc^2\theta - 4\cot^2\theta = 4\csc^2\theta + 4\csc^2\theta - 4\cot^2\theta = 4\csc^2\theta + 4(\csc^2\theta - \cot^2\theta) = 4\csc^2\theta + 4$

61) $\frac{\tan x + \cot x}{\tan x - \cot x} = \frac{\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}}{\frac{\sin x}{\cos x} - \frac{\cos x}{\sin x}} = \frac{\frac{\sin^2 x + \cos^2 x}{\cos x \sin x}}{\frac{\sin^2 x - \cos^2 x}{\cos x \sin x}} = \frac{\sin^2 x + \cos^2 xx}{\sin^2 x - \cos^2 x} = \frac{1}{\sin^2 x - \cos^2 x}$

62) $\frac{1 + \cos t}{1 - \cos t} - \frac{1 - \cos t}{1 + \cos t} = \frac{(1 + \cos t)^2 - (1 - \cos t)^2}{1 - \cos^2 t} = \frac{1 + 2\cos t + \cos^2 t - (1 - 2\cos t + \cos^2 t)}{1 - \cos^2 t} = \frac{4\cos t}{\sin^2 t} = \frac{4\cos t}{\sin t} \cdot \frac{1}{\sin t} = 4\cot t \csc t$

63) $\frac{\sqrt{2} + \sqrt{6}}{4}$

64) $\frac{\sqrt{6} - \sqrt{2}}{4}$

65) $2 - \sqrt{3}$

66) $-\sin x$

67) -1

68) $\frac{\sqrt{2}}{2}$

69) $-\sqrt{3}$

70) $-\frac{24}{25}$

71) $2\sin 4x$

72) $\frac{\sqrt{2}}{2}$

73) $\frac{1}{2}\sqrt{2 + \sqrt{3}}$

74) $-2 + \sqrt{3}$

75) $\frac{\sqrt{10}}{4}$

76) $\frac{\pi}{4}$

77) $\frac{2\pi}{3}$

78) 135°

79) -60°

80) $\frac{2\sqrt{10}}{3}$

81) $\frac{7}{8}$

82) $\frac{4\sqrt{3}-3}{10}$

83) {270°}

84) $\left\{\frac{3\pi}{4}, \frac{7\pi}{4}\right\}$

85) $\left\{0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}\right\}$

86) {60°, 135°, 300°, 315°}

87) {45°, 135°, 225°, 315°}

88) {0°, 60°, 180°, 300°}

89) {15°, 165°, 195°, 345°}

90) A = 52.9°, a = 81.02 in. c = 96.05 in.

91) B = 20.3°, C = 61.7°, c = 38.6 ft

92) A = 30°, C = 135.6°, c = 45.35 m;
A' = 150°, C' = 15.6°, c' = 17.43 m

93) no such triangle

94) 0.79 mi

95) c = 14.3 km, A = 21.3°, B = 44.3°

96) 938 mi

97) A = 22.02°, B = 49.60°, C = 108.38°

98) 13 $in.^2$

99) 24 ft^2

100) 13 m^2