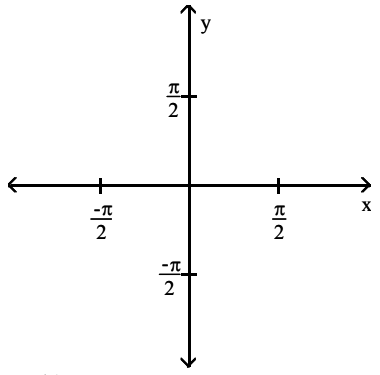
MAC 1114 Review for Exam 4

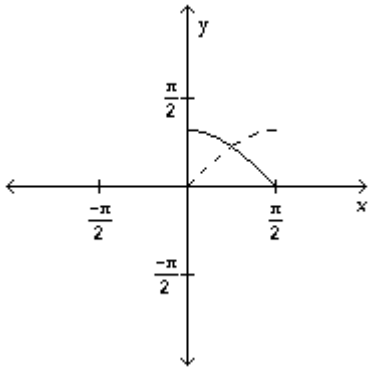
Name_____ Date: _____

Graph the function on the indicated interval, using a solid line. Then graph the inverse, using a dashed line.

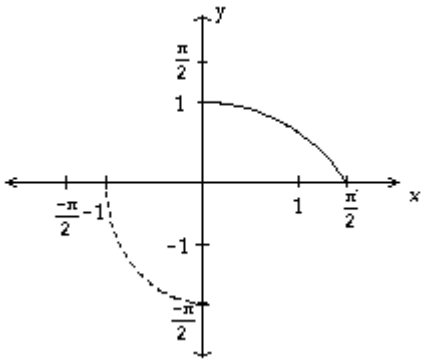
1) $y = \cos x, 0 \le x \le \frac{\pi}{2}$



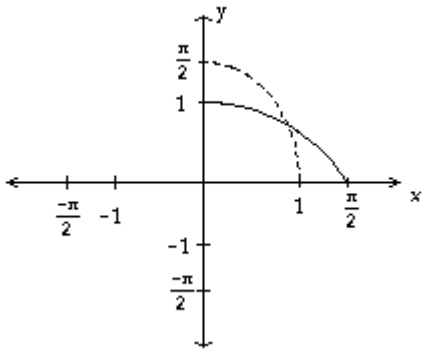
A)



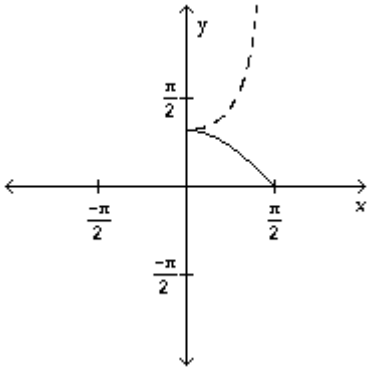
B)



C)



D)



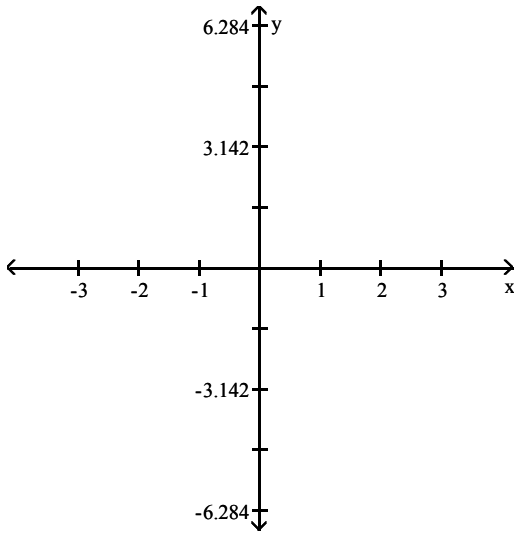
2) State the domain and the range of the inverse sine function, and graph the function using at least 3 key points.

Domain:

Range:

Key Points:

Graph



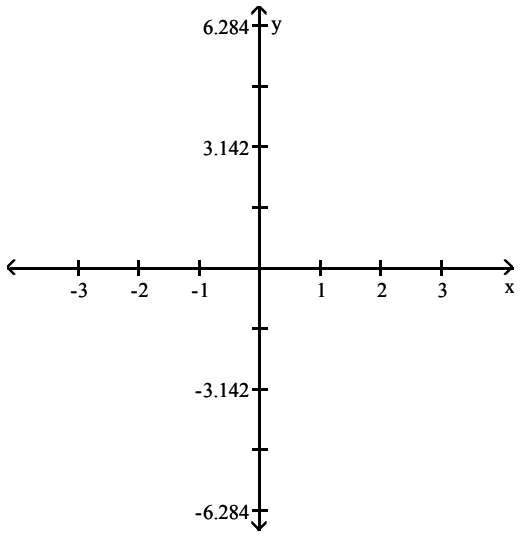
3) State the domain and the range of the inverse cosine function, and graph the function using at least 3 key points.

Domain:

Range:

Key Points:

Graph



4) State the domain and the range of the inverse tangent function, and give the equations of the asympmtotes. Graph the function using at least 3 key points.

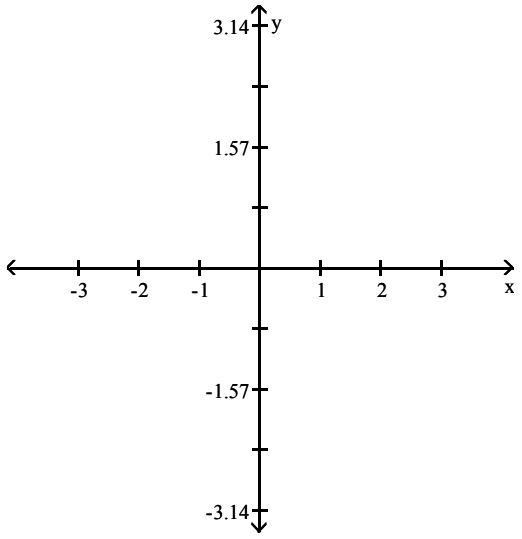
Domain:

Range:

Equations of asymptotes:

Key Points:

Graph



Find the exact value of y in radians.

5) $y = \sin^{-1}(-0.5)$

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

Give the value of the function in radians. Round your answer to three decimal places.

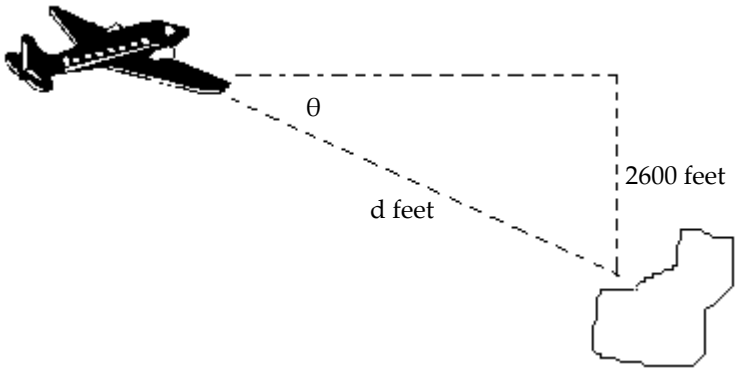
7) $\sin^{-1} -0.7153$

8) $\cos^{-1} -0.4102$

9) $\tan^{-1} -0.6634$

Solve.

10) An airplane is flying at an altitude of 2600 ft toward an island. The straight line distance from the airplane to the island is d feet. Express θ, the angle of depression, as an inverse sine function.



A) $\theta = \sin^{-1} \frac{\sqrt{d^2 - 6{,}760{,}000}}{d}$

B) $\theta = \sin^{-1} \frac{d}{2600}$

C) $\theta = \sin^{-1} \frac{d}{\sqrt{d^2 - 6{,}760{,}000}}$

D) $\theta = \sin^{-1} \frac{2600}{d}$

Give the degree measure of θ.

11) $\theta = \arcsin\left(-\frac{1}{2}\right)$

Evaluate.

12) $\cos^{-1}\left(\cos\left(-\frac{\pi}{3}\right)\right)$

13) $\cos^{-1}\left(\cos\left(\frac{\pi}{5}\right)\right)$

14) $\sin^{-1}\left(\sin\left(\frac{6\pi}{5}\right)\right)$

15) $\tan^{-1}\left(\tan\left(-\frac{3\pi}{4}\right)\right)$

16) $\sin^{-1}\left(\cos\frac{2\pi}{3}\right)$

Evaluate the expression.

17) sin (arctan 2)

18) cos (arcsin $\frac{1}{4}$)

Evaluate.

19) cos ($\tan^{-1}\sqrt{3}$)

Solve the equation for the interval [0, 2π).

20) $2\sin^2 x = \sin x$

21) $\sin^2 x - \cos^2 x = 0$

Determine all solutions of each equation in radians in the interval [0, 2π).

22) $\cos^2 x - \cos x = 0$

Solve the equation for solutions in the interval [0°, 360°).

23) $\sin 2\theta = -\frac{1}{2}$

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

Solve the triangle, if possible. Give the length of side a. Round the answer to 2 decimal places.

25) B = 18.5°
C = 110.0°
b = 13.85

a = _____

Solve the triangle, if possible. Round to the nearest hundredth.

26) B = 17.4°
b = 5.97
a = 6.65

27) B = 86.5°
b = 7.86
a = 15.5

Solve.

28) To find the distance AB across a river, a distance BC of 815 m is laid off on one side of the river. It is found that B = 108.2° and C = 14.1°. Find AB.

29) A ranger in fire tower A spots a fire at a direction of 40°. A ranger in fire tower B, which is 28 miles directly east of tower A, spots the same fire at a direction of 330°. How far from tower A is the fire?

Find the area of triangle.

30) C = 48.3°, b = 85 ft, a = 12.7 ft
Round to the nearest tenth.

Solve.

31) A triangular field has sides of 232.0 m and 202.9 m, and the angle between them measures 61.03°. Find the area of the field. Round to the nearest square meter.

Solve the triangle if possible. Find angle B in degrees (rounded to the nearest hundreth)

32) a = 8.7
b = 13.1
c = 15.9 $m\angle B =$ _____

Solve the triangle, if possible. Round to the nearest hundredth.

33) C = 120°45'
b = 4.70
a = 12.20

34) a = 7 ft
b = 7 ft
c = 16 ft

Decide whether to use the law of sines or the law of cosines. Then solve the triangle if possible. Round to the nearest hundredth, unless otherwise indicated.

35) C = 108.0°
a = 6.10
b = 9.01

36) A = 30.0°
a = 6.77
b = 13.54

37) B = 36.0°
C = 104.5°
b = 31.82

Solve.

38) Two cars leave the same place at the same time. The first drives in a straight line N 35° W at 30 miles per hour and the second drives in a straight line N 12° E at 40 miles per hour. After 1 hour, how far apart are the cars? (Round answer to the nearest mile)

39) Two ships leave a harbor together traveling on courses that have an angle of 130° between them. If they each travel 538 miles, how far apart are they to the nearest mile?

40) Two airplanes leave an airport at the same time, one going northwest (N35°W) at 406 mph and the other going east at 325 mph. How far apart are the planes after 4 hours to the nearest mile?

1) C
2) Domain: [−1, 1]; Range: $[-\frac{\pi}{2}, \frac{\pi}{2}]$; key points: $(-1, -\frac{\pi}{2})$, (0,0) , $(1, \frac{\pi}{2})$
3) Domain: [−1, 1]; Range: [0, π]; key points: (−1, π), $(0, \frac{\pi}{2})$, (1, 0)
4) Domain:(−∞, ∞); Range: $(-\frac{\pi}{2}, \frac{\pi}{2})$; Equations of Horizontal asymptotes: $y = \pm\frac{\pi}{2}$
5) $-\frac{\pi}{6}$
6) $\frac{3\pi}{4}$
7) −0.797
8) 1.993
9) −0.586
10) D
11) −30°
12) $\frac{\pi}{3}$
13) $\frac{\pi}{5}$
14) $-\frac{\pi}{5}$
15) $\frac{\pi}{4}$
16) $-\frac{\pi}{6}$
17) $\frac{2\sqrt{5}}{5}$
18) $\frac{\sqrt{15}}{4}$
19) $\frac{1}{2}$
20) $0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$
21) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$
22) $2n\pi, \frac{\pi}{2} + n\pi$
23) θ = 105°, 165°, 285°, 345°
24) θ = 15°, 165°, 195°, 345°
25) A = 51.5°, a = 34.16, c = 41.02
26) A = 19.46°, C = 143.14°, c = 11.98
27) No solution
28) 235 m
29) 26 mi
30) 403 ft^2

31) 20,591 m^2
32) A = 33.16°, B = 55.45°, C = 91.39°
33) c = 15.15, A = 43°47', B = 15°28'
34) No solution
35) Law of cosines; c = 12.34, A = 28.04°, B = 43.96°
36) Law of sines; B = 90.0°, C = 60.0°, c = 11.73
37) Law of sines; A = 39.5°, a = 34.43, c = 52.41
38) 29 miles
39) 975 mi
40) 2704 mi