MAT 204 SP11 NAME _____

TEST 4 REVIEW ASSIGNMENT Sections 8.1, 8.3 - 8.5, 9.2- 9.3

For # 1 - 3, fill in the blank with the appropriate interval.

1) The domain of $y = \sin^{-1}x$ is _____ The range of $y = \sin^{-1}x$ is _____

2) The domain of $y = \cos^{-1}x$ is _____ The range of $y = \cos^{-1}x$ is _____

3) The domain of $y = \tan^{-1}x$ is _____ The range of $y = \tan^{-1}x$ is _____

For # 4 - 7, find the EXACT value of the expression by using the special triangles or unit circle. Give answer in radian form.

4) $\cos^{-1}(0)$

5) $\sin^{-1}(-1)$

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

7) $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

For # 8 - 10, use a calculator to find the value of the inverse trig expression, in radians rounded to two decimal places.

8) $\sin^{-1}(0.7)$

9) $\cos^{-1}\left(\frac{\sqrt{6}}{5}\right)$

10) $\tan^{-1}(-2.6)$

For # 11 - 13, find the EXACT value, if any, of the expression. If there is no value, say it is "not defined". Do not use a calculator.

11) $\cos^{-1}\left(\cos\frac{4\pi}{7}\right)$

12) $\tan^{-1}\left[\tan\left(-\frac{\pi}{3}\right)\right]$

13) $\sin(\sin^{-1} 1.7)$

For # 14 - 15, find the EXACT solution of the equation.

14) $\sin^{-1} x = -\frac{\pi}{2}$

15) $4\cos^{-1} x = \pi$

For # 16 - 17, solve the equation on the interval $0° \le \theta < 360°$.

16) $2 \sin \theta + 8 = 7$

17) $3 \tan^2 \theta - 5 = 4$

For # 18 - 20, simplify the expression using trigonometric identities.

18) $\frac{\sin \theta}{1 + \cos \theta} + \frac{\cos\theta}{\sin\theta}$ *Hint: Think "common denominator"*

19) $\sin\theta + \cot\theta \cos\theta$

20) Simplify by first rewriting using a common denominator: $\frac{\cos x}{1+\sin x} + \frac{1+\sin x}{\cos x}$

For # 21 - 25, verify the identity.

21) $(1+\sin y)(1+\sin(-y)) = \cos^2 y$

22) $\frac{\sec^2\theta - 1}{\sec^2\theta} = \sin^2\theta$

23) $\frac{1}{1 - \sin\alpha} + \frac{1}{1 + \sin\alpha} = 2\sec^2\alpha$

24) $\tan\left(\frac{\pi}{2} - \theta\right) \cdot \tan\theta = 1$

25) $\sec x - \cos x = \sin x \tan x$

For # 26 - 27, find the exact value of the expression using sum or difference formulas.

26) $\sin \frac{11\pi}{12}$

27) $\tan 75°$

For # 28 - 30, find the exact value of the expression. ***(Hint: Identify the sum or difference formula and work backwards.)***

28) $\sin 330° \cos 30° - \cos 330° \sin 30°$

29) $\cos \frac{\pi}{16} \cos \frac{3\pi}{16} - \sin \frac{\pi}{16} \sin \frac{3\pi}{16}$

30) $\frac{\tan 65° + \tan 85°}{1 - \tan 65° \tan 85°}$

For # 31 - 32, verify the identity.

31) $\sin(3\pi - x) = \sin x$

32) $\cos(x + y) + \cos(x - y) = 2\cos x \cos y$

For # 33 - 35, use the information given about the angle θ to find the exact value of the indicated trigonometric double angle function.

33) $\sin\theta = \frac{7}{25}, \quad 0 < \theta < \frac{\pi}{2}$ Find $\cos(2\theta)$.

34) $\tan\theta = \frac{7}{24}, \quad \pi < \theta < \frac{3\pi}{2}$ Find $\sin(2\theta)$.

35) $\cos\theta = -\frac{2}{3}, \quad \frac{\pi}{2} < \theta < \pi$ Find $\tan(2\theta)$.

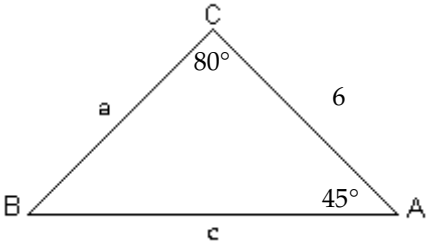
36) The range of a projectile fired at an angle θ (in degrees) to the horizontal with an initial speed of v_0 feet per second is

$r = \frac{1}{32}(v_0)^2 \sin(2\theta)$ where r is measured in feet.

An athlete throws a javelin at 75 ft per second. At what angle must the athlete throw the javelin so that the javelin travels 130 feet?

For # 37 - 38, use the Law of Sines to solve the triangle. Give lengths to two decimal places.

37)



38) B = 20°, C = 40°, a = 4

For # 39 - 41, two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. You do NOT need to solve any triangle(s) that results. SHOW ALL WORK TO JUSTIFY YOUR ANSWER.

39) a = 15, b = 25, A = 85°

40) a = 12, b = 31, A = 20.5°

41) a = 22, b = 12, A = 42°

For # 42 - 43, solve the problem.

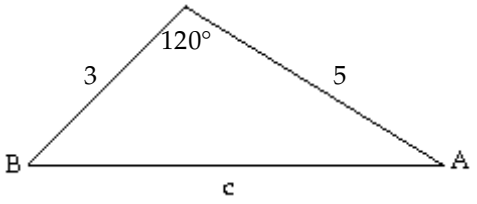
42) A ship sailing parallel to shore sights a lighthouse at an angle of 14° from its direction of travel. After traveling 2 miles farther, the angle is 20°. At that time, how far is the ship from the lighthouse? *Give answer to the nearest hundredth of a mile.*

Solve the problem.

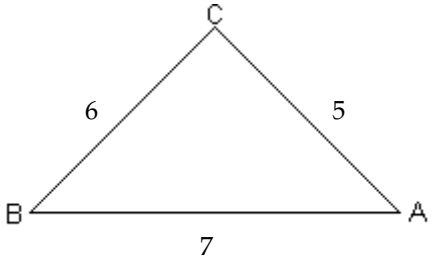
43) A guy wire to the top of a tower makes an angle of 62° with the level ground. At a point 28 feet farther from the base of the tower and in line with the base of the wire, the angle of elevation to the top of the tower is 24°. What is the length of the guy wire? *Give answer to the nearest tenth of a foot.*

For # 44 - 45, use the Law of Cosines to solve the triangle. Give angles to nearest tenth of a degree and lengths to two decimal places.

44)

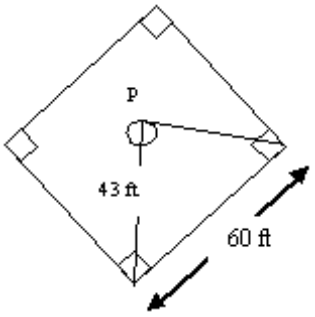


45)



For # 46 - 47, solve the problem.

46) A pitcher's mound on a women's softball field is 43 feet from home plate and the distance between bases is 60 ft. (The pithcer's mound is NOT halfway between home plate and second base.) How far is the pitcher's mound from first base? *Give answer to the nearest tenth of a foot.*



47) A ship travels 60 miles due east, then adjusts its course northward, as shown in the figure below. After traveling 80 miles in that direction, the ship is 139 miles from its departure point. Find the angle (to the nearest tenth of a degree) that the ship turned in reference to the horizontal.