

MATH 244/GRACEY
5.4 PRACTICE

Name _____

Give the coordinates of the point described on the unit circle.

1) The reflection of the point $\left(-\frac{2}{5}, \frac{3}{5}\right)$ across the x-axis

2) The reflection of the point $\left(\frac{2}{5}, -\frac{1}{5}\right)$ across the y-axis

3) The reflection of the point $\left(-\frac{3}{5}, \frac{3}{5}\right)$ across the origin

Find the function value using coordinates of points on the unit circle.

4) $\sin \frac{-2\pi}{3}$

5) $\sin \frac{-7\pi}{4}$

6) $\sin \frac{17\pi}{6}$

7) $\cos 2\pi$

8) $\cos -\frac{\pi}{2}$

9) $\cos \frac{-5\pi}{6}$

Use a calculator to find a decimal approximation for the indicated function value. Round your answer to four decimal places.

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

11) $\sin (-3.30)$

12) $\sec 2$

13) $\cot 5.79$

List the quadrants in which the function has the given sign.

14) sine is positive

15) cosine is positive

16) secant is negative

17) cotangent is positive

Determine the domain and range of the function.

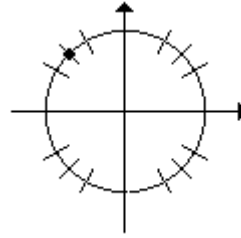
18) $y = \cos^2 x$

19) $y = |\sin x| - 1$

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

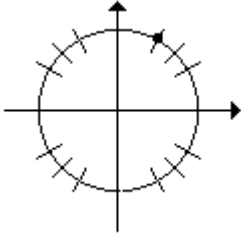
21) $y = \frac{1}{\cos x}$

24)



Find two real numbers between -2π and 2π that determine the point on the unit circle.

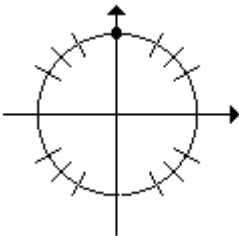
22)



Multiply and simplify.

25) $(\cos x - \sin x)^2$

23)



26) $\cot x (\sin x - \sec x)$

27) $\sec x (\cot x + \sin x)$

28) $(1 - \cot \theta)^2$

$$29) (1 - \cos x)(1 + \cos x)$$

$$35) \tan^4 x - \sec^4 x$$

$$30) \sin \theta (\sec \theta \tan \theta + \csc \theta + \cot \theta)$$

Simplify the expression.

$$36) \frac{14 \cos^3 x \sin x}{7 \sin^2 x \cos x}$$

Factor and simplify.

$$31) 1 - 2 \sin^2 x + \sin^4 x$$

$$37) \frac{\cos^2 x + 6 \cos x + 9}{\cos x + 3}$$

$$32) \frac{\sin^2 x - 1}{\sin x + 1}$$

$$38) \frac{9 \sin \phi}{\cos^2 \phi} \cdot \frac{\cos^2 \phi - \cos \phi \sin \phi}{\cos^2 \phi - \sin^2 \phi}$$

$$33) \sec^4 x - 2 \sec^2 x \tan^2 x + \tan^4 x$$

$$39) \frac{3}{\cos^2 x - \sin^2 x} + \frac{5}{\cos x + \sin x}$$

$$34) 1 - \sin^3 x$$

Simplify. Assume that all radicands are nonnegative.

40) $\sqrt{\sin x \cos x} \cdot \sqrt{\sin x}$

41) $\sqrt{\cos^2 x \sin x} \cdot \sin x$

42) $(1 - \sqrt{\tan \beta})(1 + \sqrt{\tan \beta})$

Simplify.

43) Rationalize the denominator. $\sqrt{\frac{\cos x}{\sin x}}$

44) Rationalize the denominator. $\sqrt{\frac{\sin x}{\cot x}}$

45) Rationalize the denominator. $\sqrt{\frac{1 + \sin y}{1 - \sin y}}$

46) Rationalize the denominator. $\sqrt{\frac{\sin^2 x}{2 \cos^2 x}}$

47) Rationalize the denominator. $\sqrt{\frac{1 - \sin \alpha}{1 + \sin \alpha}}$

Assume that $0 < \theta < \pi/2$. Find an expression for the indicated trigonometric function.

48) Let $x = 5 \sin \theta$ in $\sqrt{25 - x^2}$. Find $\cos \theta$.

49) Let $x = 4 \sec \theta$ in $\sqrt{x^2 - 16}$. Find $\tan \theta$.

Answer Key

Testname: 5.4PRAC

$$1) \left(-\frac{2}{5}, -\frac{3}{5} \right)$$

$$2) \left(-\frac{2}{5}, -\frac{1}{5} \right)$$

$$3) \left(\frac{3}{5}, -\frac{3}{5} \right)$$

$$4) -\frac{\sqrt{3}}{2}$$

$$5) \frac{\sqrt{2}}{2}$$

$$6) \frac{1}{2}$$

$$7) 1$$

$$8) 0$$

$$9) -\frac{\sqrt{3}}{2}$$

$$10) -0.5878$$

$$11) 0.1577$$

$$12) -2.4030$$

$$13) -1.8605$$

$$14) \text{I, II}$$

$$15) \text{I, IV}$$

$$16) \text{II, III}$$

$$17) \text{I, III}$$

$$18) \text{Domain: } (-\infty, \infty); \text{range: } [0, 1]$$

$$19) \text{Domain: } (-\infty, \infty); \text{range: } [-1, 0]$$

$$20) \text{Domain: } (-\infty, \infty); \text{range: } [-2, -1]$$

$$21) \text{Domain: } \{x \mid x \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z}\};$$

$$\text{range: } (-\infty, -1] \cup [1, \infty)$$

$$22) \frac{\pi}{3}, \frac{-5\pi}{3}$$

$$23) \frac{\pi}{2}, \frac{-3\pi}{2}$$

$$24) \frac{3\pi}{4}, \frac{-5\pi}{4}$$

$$25) 1 - 2 \sin x \cos x$$

$$26) \cos x - \csc x$$

$$27) \csc x + \tan x$$

$$28) \csc^2 \theta - 2 \cot \theta$$

$$29) \sin^2 x$$

$$30) \sec^2 \theta + \cos \theta$$

$$31) \cos^4 x$$

$$32) \sin x - 1$$

$$33) 1$$

$$34) (1 - \sin x)(1 + \sin x + \sin^2 x)$$

$$35) -2 \tan^2 x - 1$$

$$36) 2 \cos x \cot x$$

$$37) \cos x + 3$$

$$38) \frac{9 \sin \phi}{(\cos \phi)(\cos \phi + \sin \phi)}$$

$$39) \frac{-5 \sin x + 5 \cos x + 3}{\cos^2 x - \sin^2 x}$$

$$40) \sin x \sqrt{\cos x}$$

$$41) \sin x \cos x \sqrt{\sin x}$$

$$42) 1 - \tan \beta$$

$$43) \frac{\sqrt{\cos x \sin x}}{\sin x}$$

$$44) \frac{\sqrt{\cos x}}{\cot x}$$

$$45) \frac{\cos y}{1 - \sin y}$$

$$46) \frac{\sqrt{2} \tan x}{2}$$

$$47) \frac{\cos \alpha}{1 + \sin \alpha}$$

$$48) \frac{\sqrt{25 - x^2}}{5}$$

$$49) \frac{\sqrt{x^2 - 16}}{4}$$