6.2: (Trigonometric Functions of Real Numbers)

If $\cos\alpha = \frac{12}{13}$ and $\frac{3\pi}{2} < \alpha < 2\pi$ then $\frac{\sec\alpha - \tan\alpha}{\sin\alpha} =$

(A) $-\frac{39}{10}$

B) $\frac{28}{15}$

C) $-\frac{18}{5}$

D) $-\frac{8}{5}$

E) $\frac{29}{5}$

If $\frac{2\sin x\cos(-x) - 2\sin(-x) + 2\cos(-x) + 2}{1 + 2\cos x + \cos^2 x - \sin^2 x} = \frac{a + b\sin x}{\cos x}$, then $a + b =$

A) 2

B) -2

C) 0

D) 1

E) -1

If ($a, -\frac{3}{4}$) is a point on a unit circle on the terminal side of an angle θ, in standard position, in quadrant III, then $\cos\theta =$

A) $-\frac{\sqrt{7}}{4}$

B) $-\frac{\sqrt{7}}{2}$

C) $-\frac{a}{4}$

D) $-\frac{a}{2}$

E) $-\frac{5}{4}$

If the point $(-2, y)$ lies on the terminal side of an angle θ in standard position, and $\cot\theta = \frac{2}{3}$, then the value of y is

(A) -3

(B) $-\frac{5}{3}$

(C) $-\frac{4}{3}$

(D) $-\frac{1}{3}$

(E) -2

If $\theta = 12\text{rad}$, then $\csc\theta =$

A) $-\csc(4\pi - 12)$

B) $\csc\left(\frac{\pi}{2} - 12\right)$

C) $\csc\left(12 - \frac{\pi}{2}\right)$

D) $\csc\left(12 - \frac{7\pi}{3}\right)$

E) $\csc(4\pi - 12)$

If $\tan\theta = -\frac{5}{3}$ and θ is in the second quadrant, then $\frac{\csc\theta - \cot\theta}{\cos\theta} =$

(A) $-\frac{34+3\sqrt{34}}{15}$

B) $\frac{3+\sqrt{34}}{15}$

C) $-\frac{\sqrt{34}}{15}$

D) $\frac{3\sqrt{34}-34}{34}$

E) $\frac{34}{9} - \frac{\sqrt{34}}{5}$

$\tan\left(-\frac{7\pi}{4}\right) - \sin^2(-135°) =$

(A) $\frac{1}{2}$

B) $\frac{8}{3}$

C) $2 + \sqrt{3}$

D) $-\frac{8}{3}$

E) $-\frac{3}{2}$

$\tan(-150°) + \csc\left(\frac{5\pi}{3}\right) =$

A) $-\frac{\sqrt{3}}{3}$

B) $\frac{\sqrt{3}}{3}$

C) $\frac{2\sqrt{3}}{3}$

D) $2\sqrt{3}$

E) $-3\sqrt{3}$

$\sin\left(\frac{2\pi}{3}\right)\cos\left(\frac{5\pi}{6}\right)+\tan\left(\frac{11\pi}{4}\right)=$

A) $-\frac{7}{4}$

B) $\frac{1}{4}$

C) $-\frac{1}{4}$

D) $\frac{5}{4}$

E) $-\frac{5}{4}$

The exact value of $12\csc\left(\frac{35\pi}{3}\right)+\tan\left(-\frac{2\pi}{3}\right)$ is equal to

A) $-7\sqrt{3}$

B) $\frac{10\sqrt{3}}{3}$

C) $-3\sqrt{3}$

D) $4\sqrt{3}$

E) $-5\sqrt{3}$

Which ONE of the following statements is IMPOSSIBLE?

A) $\cot^2\theta - \csc^2\theta = 1$

B) $\tan\theta = \frac{22}{7}$

C) $\cot\theta = -100$

D) $\cos\theta = -\frac{4}{7}$ and $\sec\theta = -\frac{7}{4}$

E) $\sin\theta = \frac{1}{5}$ and $\csc\theta = 5$

If $f(x) = \frac{x^2\sin x}{\sec^3 x}$ and $g(x) = \cot x$, then

A) f is an odd function and g is an odd function

B) f is an even function and g is an even function

C) f is an even function and g is an odd function

D) f is an odd function and g is an even function

E) f is an even function and g is neither an odd nor an even function

Which one of the following is FALSE?

A) $f(x) = |x|\tan(\sin x)$ is an even function

B) $f(x) = |x|\cot x - \sin x$ is an odd function

C) $f(x) = \csc x \tan x$ is an even function

D) $f(x) = x^2 \cos x \sin^3 2x$ is an odd function

E) $f(x) = x^3 + \sec x$ is neither even nor odd function

$f(x) = 3 + \cos x$ and $g(x) = x\sin^2 x$, then

A) f is an even function and g is an odd function.

B) f is an even function and g is an even function.

C) f is an odd function and g is an odd function.

D) f is an odd function and g is an even function.

E) both functions f and g are neither odd nor even functions.

Which one of the following statements is FALSE?

A) $f(x) = \sin(\cos x)$ is an odd function

B) If $\sin\theta > 0$ and $\cos\theta < 0$, then θ is in quadrant II

C) $\csc\pi$ is undefined

D) $\log_5(\cos 0) = 0$

E) $f(x) = x\sin x$ is an even function

$$\tan\left(\frac{23\pi}{6}\right) + \csc\left(\frac{11\pi}{6}\right) =$$

A) $\frac{-\sqrt{3}-6}{3}$

B) $\frac{-\sqrt{3}+6}{3}$

C) $\frac{-2\sqrt{3}-3}{6}$

D) $\frac{\sqrt{3}+2}{3}$

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

The value of $\cot\left(-\frac{17\pi}{3}\right)+\sin\left(\frac{11\pi}{6}\right)=$

A) $\frac{2\sqrt{3}-3}{6}$

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

C) $\frac{\sqrt{3}-3}{3}$

D) $\frac{2\sqrt{3}-1}{6}$

E) $\frac{\sqrt{3}+2}{2}$

$\sec\left(-\frac{23\pi}{6}\right)\cot\left(\frac{16\pi}{3}\right)=$

A) $\frac{2}{3}$

B) $-\frac{2}{3}$

C) 2

D) $-\frac{3}{2}$

E) -3

$$\sec\left(-\frac{23\pi}{6}\right)+\tan\left(\frac{17\pi}{3}\right)=$$

A) $\frac{-\sqrt{3}}{3}$

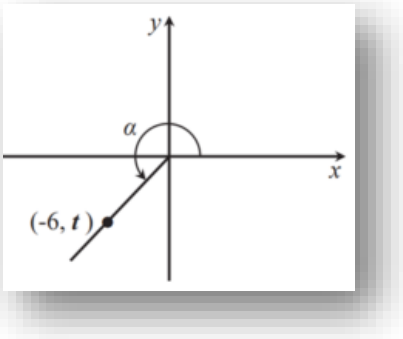
B) $\frac{\sqrt{3}}{3}$

C) $-\sqrt{3}$

D) $\sqrt{3}$

E) $\frac{5\sqrt{3}}{3}$

In the figure below, if $\sin\alpha=-\frac{4}{5}$, then the value of t is



A) -8

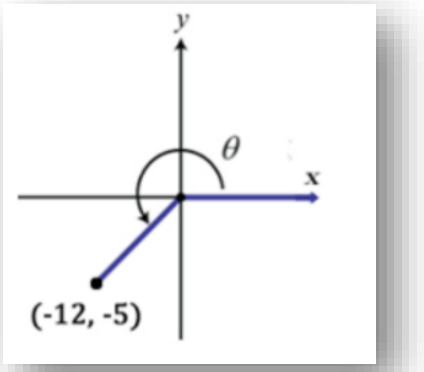
B) -6

C) -4

D) -3

E) -2

For the angle θ shown in the adjacent diagram, $\csc\theta + \cot\theta$ is equal to



A) $-\frac{1}{5}$

B) -5

C) $-\frac{13}{5}$

D) $-\frac{3}{20}$

E) -3

Which one of the following statements is FALSE?

(a) If $\tan\theta = \frac{2}{3}$, then $\sin\theta = 2$ and $\cos\theta = 3$

(b) $f(x) = x\sin^2 x$ is an odd function

(c) $f(x) = \tan(\cos x)$ is an even function

(d) $f(x) = \log(\sin x)$ is neither even nor odd function

(e) $\tan^2 x - \sec^2 x = -1$