1) $1 - \cot\left(\frac{19\pi}{4}\right) + \csc^2(-330^\circ) =$

A) 6

B) 4

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

D) $\frac{10}{3}$

E) 3

2) If $\csc\theta = \frac{2\sqrt{3}}{3}$, $\cot\theta < 0$, and the point $(x, 3)$ lies on the terminal side of angle θ in standard position, then $x =$

A) $-\sqrt{3}$

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

C) -3

D) 3

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

3) If α is the smallest positive coterminal angle of $\frac{29\pi}{6}$, and β is the reference angle of $-480°$, then $\cos(\alpha + \beta) =$

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

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

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

D) $-\frac{1}{2}$

E) 1

4) If $f(x) = \frac{x - \sin x}{\tan^3 x}$ and $g(x) = \csc x + \cot x$, 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) f is an even function and g is neither an odd nor an even function

5) If $\cos\theta = \frac{1}{x}$ and θ is in the fourth quadrant, $\tan^2\left(\frac{\theta}{2}\right) =$

A) $\frac{x-1}{x+1}$

B) $\frac{x+1}{x-1}$

C) $x^2 - 1$

D) $1 - x^2$

E) $\sqrt{x^2-1}$

6) The graph of $y = \sin\left|\pi x - \frac{\pi}{2}\right|$, $-1 < x < 2$, is **decreasing** on the interval

A) $(0,\ 1/2) \cup (1, 2)$

B) $(-1, 0) \cup (1/2, 1)$

C) $(-1, 0) \cup (1, 2)$

D) $(0,\ 1)$

E) $(-1, 0)$

7) The **sum** of all the x–intercepts of the graph of $y = \cos\left(2x + \frac{\pi}{2}\right)$, where $-\frac{\pi}{2} \le x \le \pi$, is

A) π

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

C) $\frac{\pi}{2}$

D) 2π

E) 0

8) The **range** of the function $f(x) = 1 - |3\sec 2x|$, is

A) $(-\infty, -2]$

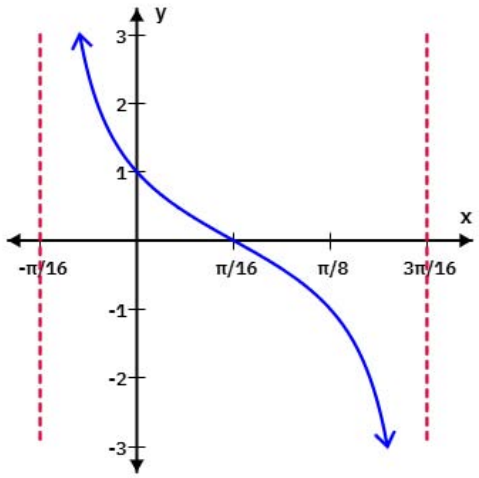
B) $(-\infty, -3]$

C) $(-\infty, -3] \cup [3, \infty)$

D) $(-\infty, -4] \cup [2, \infty)$

E) $(-\infty, -2] \cup [4, \infty)$

9) The adjacent graph represents part of the graph of the function



A) $y = -\tan\left(4x - \frac{\pi}{4}\right)$

B) $y = -\tan\left(x - \frac{\pi}{16}\right)$

C) $y = \cot\left(x - \frac{\pi}{16}\right)$

D) $y = \cot\left(4x - \frac{\pi}{4}\right)$

E) $y = -\cot\left(4x + \frac{\pi}{4}\right)$

10) If the graph of the function $f(x) = \sqrt{3}\csc(bx + c)$ has a period of $\frac{1}{2}$, and a horizontal shift of $-\frac{1}{4}$, then $f\left(\frac{1}{12}\right) =$

A) -2

B) 2

C) 0

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

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

11) $\cot\left[5\sin^{-1}\left(-\frac{1}{2}\right)\right] =$

A) $\sqrt{3}$

B) $-\sqrt{3}$

C) 0

D) $2-\sqrt{3}$

E) $2+\sqrt{3}$

12) If $\tan^{-1}x = \frac{7\pi}{12} - \cos^{-1}\left[\cos\left(-\frac{5\pi}{12}\right)\right]$, then $x =$

A) $\frac{1}{\sqrt{3}}$

B) $-\frac{1}{\sqrt{3}}$

C) 0

D) $-\sqrt{3}$

E) $\sqrt{3}$

13) The expression $\csc^2(-x) + \sec^2(-x)$ simplifies to

A) $\csc^2 x \sec^2 x$

B) $-\csc^2 x \sec^2 x$

C) $\cot^2 x - \tan^2 x$

D) $\tan^2 x + \cot^2 x$

E) $\tan^2 x - \cot^2 x$

14) $\dfrac{1+\sin x}{1-\sin x} - \dfrac{1-\sin x}{1+\sin x} =$

A) $4 \tan x \sec x$

B) $-4 \tan x \sec x$

C) $-4 \tan x$

D) -1

E) 2

15) $\cos 55° \sin 40° - \sin 55° \sin 50° =$

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

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

C) $-\frac{\sqrt{2} + \sqrt{6}}{4}$

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

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

16) If A is the amplitude and P is the period of $y = \frac{1}{\sec(2x)} - \frac{\sqrt{3}}{\csc(2x)}$ then $A \cdot P =$

A) 2π

B) π

C) $-\pi$

D) $\frac{\pi}{2}$

E) $\frac{\pi}{3}$

17) $(\cos 15^\circ - \sin 15^\circ)^2 =$

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

B) 1

C) $\frac{1-\sqrt{3}}{2}$

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

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

18) $\csc\left[\cos^{-1}\left(-\frac{1}{2}\right) - \frac{\pi}{6} - \sin^{-1}\left(\frac{2}{3}\right)\right] =$

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

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

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

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

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

19) $\tan\left(\frac{5\pi}{8}\right) =$

A) $-\sqrt{2}-1$

B) $\sqrt{2}-1$

C) $\sqrt{2}+1$

D) $-\sqrt{2}+1$

E) $\sqrt{3}+3$

20) If $\cos\alpha = \frac{3}{5}$, where α is in the 4th quadrant, and $\cot\beta = -\frac{4}{3}$, where β is in the 2nd quadrant, then $\cos(\alpha+\beta) =$

A) 0

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

C) $\frac{24}{25}$

D) $-\frac{7}{25}$

E) $\frac{7}{25}$

Answer Key
Testname: MATH012_E2_251

1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) A
10) A
11) A
12) A
13) A
14) A
15) A
16) A
17) A
18) A
19) A
20) A