Honors Pre-Calculus Name_____ ID: 1

Unit 4 Quiz 1

Date_____ Period____

Find the exact value of each expression.

1) $\cos^{-1}\left(\cot\frac{3\pi}{4}\right)$

2) $\tan^{-1}\left(\csc-\frac{\pi}{2}\right)$

Solve each equation for $0 \le \theta < 2\pi$.

3) $-1 = -5 - 4\cos 4\theta$

4) $-5 + \tan\left(\theta + \frac{4\pi}{3}\right) = -5$

Solve each triangle. Round your answers to the nearest tenth.

5) In $\triangle DEF$, $m\angle D = 42°$, $f = 40$ in, $d = 35$ in

6) In $\triangle CAB$, $b = 27$, $a = 23$, $m\angle C = 114°$

Use identities to find the value of each expression.

7) If $\cos\left(\frac{\pi}{2} - \theta\right) = 0.26$, find $\sin\theta$.

8) If $\tan\left(\frac{\pi}{2} - \theta\right) = 0$, find $\cot\theta$.

9) Find $\tan\theta$ and $\cot\theta$ if $\cos\theta = -\frac{1}{2}$ and $\tan\theta > 0$.

10) Find $\cot\theta$ and $\csc\theta$ if $\cos\theta = \frac{4}{5}$ and $\csc\theta < 0$.

11) Find $\sin\theta$ and $\sec\theta$ if $\cot\theta = -3$ and $\sin\theta < 0$.

12) Find $\cot\theta$ and $\cos\theta$ if $\sin\theta = -\frac{4}{7}$ and $\cos\theta > 0$.

Verify the identity. Show all steps.

13) $-\cos x \csc x = -\cot x$

14) $\sin x \sec x = \dfrac{1}{\cot x}$

15) $\dfrac{\sec x}{\sin^3 x} = \dfrac{\csc^3 x}{\cos x}$

16) $\dfrac{\cot^2 x + 1}{\tan^2 x} = \csc^2 x \cot^2 x$

17) $\dfrac{\cos^2 x}{1 + \cot^2 x} = \dfrac{\sin^2 x}{\sec^2 x}$

18) $\dfrac{\sin^2 x + \cos^2 x}{\tan x} = \dfrac{\csc x}{\sec x}$

19) $\dfrac{\tan^2 x + 1}{\csc x} = \dfrac{\sec x}{\cot x}$

20) $\dfrac{\tan^2 x}{\csc^2 x + \sec^2 x} = \dfrac{\sin^2 x}{\csc^2 x}$

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Find the exact value of each expression.

1) $\cos^{-1}\left(\cot\frac{3\pi}{4}\right)$ π

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Solve each equation for $0 \le \theta < 2\pi$.

3) $-1 = -5 - 4\cos 4\theta$

$\left\{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}\right\}$

4) $-5 + \tan\left(\theta + \frac{4\pi}{3}\right) = -5$

$\left\{\frac{2\pi}{3}, \frac{5\pi}{3}\right\}$

Solve each triangle. Round your answers to the nearest tenth.

5) In $\triangle DEF$, $m\angle D = 42°$, $f = 40$ in, $d = 35$ in

$m\angle E = 88.1°$, $m\angle F = 49.9°$, $e = 52.3$ in
Or $m\angle E = 7.9°$, $m\angle F = 130.1°$, $e = 7.2$ in

6) In $\triangle CAB$, $b = 27$, $a = 23$, $m\angle C = 114°$

$m\angle A = 30°$, $m\angle B = 36°$, $c = 42$

Use identities to find the value of each expression.

7) If $\cos\left(\frac{\pi}{2} - \theta\right) = 0.26$, find $\sin\theta$.

0.26

8) If $\tan\left(\frac{\pi}{2} - \theta\right) = 0$, find $\cot\theta$.

0

9) Find $\tan\theta$ and $\cot\theta$ if $\cos\theta = -\frac{1}{2}$ and $\tan\theta > 0$.

$\sqrt{3}$ and $\frac{\sqrt{3}}{3}$

10) Find $\cot\theta$ and $\csc\theta$ if $\cos\theta = \frac{4}{5}$ and $\csc\theta < 0$.

$-\frac{4}{3}$ and $-\frac{5}{3}$

11) Find $\sin\theta$ and $\sec\theta$ if $\cot\theta = -3$ and $\sin\theta < 0$.

$-\frac{\sqrt{10}}{10}$ and $\frac{\sqrt{10}}{3}$

12) Find $\cot\theta$ and $\cos\theta$ if $\sin\theta = -\frac{4}{7}$ and $\cos\theta > 0$.

$-\frac{\sqrt{33}}{4}$ and $\frac{\sqrt{33}}{7}$

Verify the identity. Show all steps.

13) $-\cos x\csc x = -\cot x$

$-\cos x\csc x$ Use $\csc x = \frac{1}{\sin x}$

$-\frac{\cos x}{\sin x}$ Use $\cot x = \frac{\cos x}{\sin x}$

$-\cot x$ ■

14) $\sin x\sec x = \frac{1}{\cot x}$

$\sin x\sec x$ Use $\sec x = \frac{1}{\cos x}$

$\frac{\sin x}{\cos x}$ Use $\cot x = \frac{\cos x}{\sin x}$

$\frac{1}{\cot x}$ ■

15) $\frac{\sec x}{\sin^3 x} = \frac{\csc^3 x}{\cos x}$

$\frac{\sec x}{\sin^3 x}$ Use $\csc x = \frac{1}{\sin x}$

$\csc^3 x\sec x$ Use $\sec x = \frac{1}{\cos x}$

$\frac{\csc^3 x}{\cos x}$ ■

16) $\frac{\cot^2 x + 1}{\tan^2 x} = \csc^2 x\cot^2 x$

$\frac{\cot^2 x + 1}{\tan^2 x}$ Use $\cot^2 x + 1 = \csc^2 x$

$\frac{\csc^2 x}{\tan^2 x}$ Use $\cot x = \frac{1}{\tan x}$

$\csc^2 x\cot^2 x$ ■

17) $\frac{\cos^2 x}{1 + \cot^2 x} = \frac{\sin^2 x}{\sec^2 x}$

$\frac{\cos^2 x}{1 + \cot^2 x}$ Use $\cot^2 x + 1 = \csc^2 x$

$\frac{\cos^2 x}{\csc^2 x}$ Use $\csc x = \frac{1}{\sin x}$

$\cos^2 x\sin^2 x$ Use $\sec x = \frac{1}{\cos x}$

$\frac{\sin^2 x}{\sec^2 x}$ ■

18) $\frac{\sin^2 x + \cos^2 x}{\tan x} = \frac{\csc x}{\sec x}$

$\frac{\sin^2 x + \cos^2 x}{\tan x}$ Use $\sin^2 x + \cos^2 x = 1$

$\frac{1}{\tan x}$ Use $\tan x = \frac{\sin x}{\cos x}$

$\frac{\cos x}{\sin x}$ Use $\csc x = \frac{1}{\sin x}$

$\csc x\cos x$ Use $\sec x = \frac{1}{\cos x}$

$\frac{\csc x}{\sec x}$ ■

19) $\dfrac{\tan^2 x + 1}{\csc x} = \dfrac{\sec x}{\cot x}$

$\dfrac{\tan^2 x + 1}{\csc x}$ Use $\tan^2 x + 1 = \sec^2 x$

$\dfrac{\sec^2 x}{\csc x}$ Use $\sec x = \dfrac{1}{\cos x}$

$\dfrac{\sec x}{\csc x \cos x}$ Use $\csc x = \dfrac{1}{\sin x}$

$\dfrac{\sec x \sin x}{\cos x}$ Use $\cot x = \dfrac{\cos x}{\sin x}$

$\dfrac{\sec x}{\cot x}$ ■

20) $\dfrac{\tan^2 x}{\csc^2 x + \sec^2 x} = \dfrac{\sin^2 x}{\csc^2 x}$

$\dfrac{\tan^2 x}{\csc^2 x + \sec^2 x}$ Decompose into sine and cosine

$\dfrac{\left(\dfrac{\sin x}{\cos x}\right)^2}{\left(\dfrac{1}{\sin x}\right)^2 + \left(\dfrac{1}{\cos x}\right)^2}$ Simplify

$\dfrac{\sin^4 x}{\cos^2 x + \sin^2 x}$ Use $\sin^2 x + \cos^2 x = 1$

$\sin^4 x$ Use $\csc x = \dfrac{1}{\sin x}$

$\dfrac{\sin^2 x}{\csc^2 x}$ ■