Practice Ch. 7 Test

F.A.T.

Name ~~Key~~

Find the exact value of the following.

1. $cos^{-1}(cos\frac{2\pi}{6})$

$\frac{\pi}{3}$

2. $sin^{-1}(sin\frac{\pi}{6})$

$\frac{\pi}{6}$

3. $tan^{-1}(tan-\frac{\pi}{4})$

$-\frac{\pi}{4}$

4. $sin^{-1}\left(\frac{1}{2}\right)$

$\frac{\pi}{6}$

5. $cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

$\frac{\pi}{6}$

6. $tan^{-1}(-1)$

$-\frac{\pi}{4}$

Find the exact value of the following. If there is no value, say "undefined".

7. $\sin(sin^{-1}6)$

und.

8. $\cos(cos^{-1}\frac{1}{2})$

$\frac{1}{2}$

9. $\tan(tan^{-1}1)$

1

10. $cos\left(cos^{-1}\frac{\sqrt{3}}{2}\right)$

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

11. $\sin(sin^{-1}-1)$

-1

12. $tan^{-1}\left(\tan\frac{5\pi}{4}\right)$

$\frac{\pi}{4}$

Solve the following equations. Give answers for ALL the solutions.

13. $\cos\theta = \frac{1}{2}$

$\frac{\pi}{3} + 2n\pi$

$\frac{5\pi}{3} + 2n\pi$

14. $\sin\theta = \frac{\sqrt{3}}{2}$

$\frac{2\pi}{3} + 2n\pi$

$\frac{\pi}{3} + 2n\pi$

15. $\tan x = -\frac{\sqrt{3}}{3}$

$\frac{5\pi}{6} + n\pi$

16. $\cot\theta = -\frac{1}{\sqrt{3}}$

$\frac{2\pi}{3} + n\pi$

17. $\sec\theta = -\frac{2}{\sqrt{3}}$

$\frac{5\pi}{6} + 2n\pi$

$\frac{7\pi}{6} + 2n\pi$

18. $\sin\theta = .6$

$.64 + 2n\pi$

$2.5 + 2n\pi$

Solve the following equations on the interval $0 \le \theta < 2\pi$

19. $1 - \sin^2 x = 0$

$\frac{\pi}{3}, \frac{3\pi}{2}$

20. $\tan\theta - \sqrt{3} = 0$

$\frac{\pi}{3}, \frac{4\pi}{3}$

21. $2\sin^2\theta - 3\sin\theta = -1$

$\frac{\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$

22. $2\cos x = 3\cos x - 1$

0

23. $4cos^2\theta = 1 + 4sin\theta$

$\frac{\pi}{6}$, $\frac{5\pi}{6}$, $\emptyset$

24. $cos2\theta = \frac{1}{2}$

$\frac{\pi}{6}$, $\frac{5\pi}{6}$

$\frac{7\pi}{6}$, $\frac{11\pi}{6}$

Find the cos$(\alpha + \beta)$

25. $\cos\alpha = \frac{4}{5}, 0 < \alpha < \frac{\pi}{2}; \cos\beta = \frac{5}{13}, -\frac{\pi}{2} < \beta < 0$

$\frac{56}{65}$

Use the sum/difference identities to find the value of the following.

26. $sin\left(\frac{5\pi}{12}\right)$ $\frac{\sqrt{6}+\sqrt{2}}{4}$

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Prepare a step by step proof of each the following identities with **every step shown to receive credit**. Neatness counts!! Remember, I have to read your elegant proofs!! If you are unable to work out a problem, write IDK next to the problem to receive 2 points.

1. $\csc\theta - \sin\theta = \cos\theta \cdot \cot\theta$

$\frac{1}{\sin\theta} - \sin\theta \quad \frac{\sin\theta}{\sin\theta}$

$\frac{1}{\sin\theta} - \frac{\sin^2\theta}{\sin\theta}$

$\frac{1-\sin^2\theta}{\sin\theta}$

$\frac{\cos^2\theta}{\sin\theta}$

$\cos\theta \quad \frac{\cos\theta}{\sin\theta}$

$\cos\theta = \cot\theta$

2. $\frac{2\sin\theta + 1}{\sin 2\theta} = \sec\theta + \csc 2\theta$

3. $\frac{\cos\theta}{1-\sin\theta} = \sec\theta + \tan\theta$

$\frac{\cos\theta}{1-\sin\theta} \quad \frac{(1+\sin\theta)}{(1+\sin\theta)}$

$\frac{\cos\theta(1+\sin\theta)}{1-\sin^2\theta}$

$\frac{\cos\theta(1+\sin\theta)}{\cos^2\theta}$

$\frac{\cos\theta + \sin\theta\cos\theta}{\cos^2\theta}$

$\frac{\cos\theta}{\cos^2\theta} + \frac{\sin\theta\cos\theta}{\cos^2\theta}$

$\frac{1}{\sec\theta} + \frac{\sin\theta}{\cos\theta}$

$\sec\theta + \tan\theta$

$\frac{1}{\cos\theta} + \frac{\sin\theta}{\cos\theta}$

$\frac{1+\sin\theta}{\cos\theta}$

4. $\frac{1+\csc\theta}{1-\csc\theta} = \frac{\sin\theta+1}{\sin\theta-1}$

$$\frac{(1+\csc\theta)(1+\csc\theta)}{(1-\csc\theta)(1+\csc\theta)}$$

$$\frac{(1+\csc\theta)^2}{1-\csc^2\theta}$$

$$\frac{1+\frac{1}{\sin\theta}}{1-\frac{1}{\sin\theta}}$$

$$\frac{\frac{\sin\theta+1}{\sin\theta}}{\frac{\sin\theta-1}{\sin\theta}}$$

$$\frac{\sin\theta+1}{\cancel{\sin\theta}}\cdot\frac{\cancel{\sin\theta}}{\sin\theta-1}$$

$$\frac{\sin\theta+1}{\sin\theta-1}$$

5. $\boxed{\cot^2\theta - \cos^2\theta} = \cot^2\theta\cdot\cos^2\theta$

$$\frac{\cos^2\theta}{\sin^2\theta}\cdot\cos^2\theta$$

$$\frac{1-\sin^2\theta}{\sin^2\theta}\cdot\cos^2\theta$$

$$\frac{\cos^2\theta-\sin^2\theta\cos^2\theta}{\sin^2\theta}$$

$$\frac{\cos^2\theta}{\sin^2\theta}-\frac{\sin^2\theta\cos^2\theta}{\sin^2\theta}$$

$$\cot^2\theta-\cos^2\theta$$

or

$$\frac{\cos^2\theta}{\sin^2\theta}-\cos^2\theta$$

$$\frac{\cos^2\theta}{\sin^2\theta}-\cos^2\theta\,\frac{\sin^2\theta}{\sin^2\theta}$$

$$\frac{\cos^2\theta-\cos^2\theta\sin^2\theta}{\sin^2\theta}$$

$$\frac{\cos^2\theta(1-\sin^2\theta)}{\sin^2\theta}$$

$$\frac{\cos^2\theta(\cos^2\theta)}{\sin^2\theta}$$

$$\frac{\cos^2\theta\cdot\cos^2\theta}{\sin^2\theta}$$

$$\cot^2\theta\cdot\cos^2\theta$$