Math 1060 Name_____

Practice Exam 2

Show all work for any credit

Find the exact value of the expression. Do not use a calculator. (5 pts each)

1) $\sin^{-1}\left(\sin\frac{3\pi}{5}\right)$ 1) _____

2) $\tan^{-1}\left(\tan\frac{6\pi}{7}\right)$ 2) _____

Find the exact value of the expression. (5 pts)

3) $\cot\left[\cos^{-1}\left(-\frac{8}{17}\right)\right]$ 3) _____

Establish the identity. (15 pts each)

4) $\dfrac{\sec\theta - 1}{\tan\theta} = \dfrac{\tan\theta}{\sec\theta + 1}$ 4) _____

5) $\dfrac{\csc\theta + \cot\theta}{\tan\theta + \sin\theta} = \csc\theta\cot\theta$ 5) _____

Find the exact value under the given conditions. (10 pts.)

6) $\tan\alpha = \dfrac{5}{12},\ \pi < \alpha < \dfrac{3\pi}{2};\quad \cos\beta = -\dfrac{3}{5},\ \dfrac{\pi}{2} < \beta < \pi$ Find $\sin(\alpha - \beta)$. 6) _____

Find the exact value of the expression. (10 pts.)

7) $\cos\left(\tan^{-1}\frac{4}{3} - \sin^{-1}\frac{3}{5}\right)$ 7) _____

Solve the equation on the interval $0 \le \theta < 2\pi$. (5 pts.)

8) $\csc(3\theta) = 0$ 8) _____

Solve the equation on the interval $0 \le \theta < 2\pi$. (10 pts. each)

9) $\cot\theta = 2\cos\theta$ 9) _____

10) $\sec \frac{3\theta}{2} = -\sqrt{2}$ 10) _____

11) $\cos(2\theta) = \sin\theta$ 11) _____

Answer Key
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1) $\frac{2\pi}{5}$

2) $-\frac{\pi}{7}$

3) $-\frac{8}{15}$

4) $\frac{\sec\theta - 1}{\tan\theta} = \frac{\sec\theta - 1}{\tan\theta} \cdot \frac{\sec\theta + 1}{\sec\theta + 1} = \frac{\sec^2\theta - 1}{\tan\theta(\sec\theta + 1)} = \frac{\tan^2\theta}{\tan\theta(\sec\theta + 1)} = \frac{\tan\theta}{\sec\theta + 1}$

5) $\frac{\csc\theta + \cot\theta}{\tan\theta + \sin\theta} = \frac{\frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta}}{\frac{\sin\theta}{\cos\theta} + \sin\theta} = \frac{\frac{1 + \cos\theta}{\sin\theta}}{\frac{\sin\theta + \sin\theta\cos\theta}{\cos\theta}} = \frac{1 + \cos\theta}{\sin\theta} \cdot \frac{\cos\theta}{\sin\theta(1 + \cos\theta)} = \frac{1}{\sin\theta} \cdot \frac{\cos\theta}{\sin\theta} = \csc\theta\cot\theta$

6) $-\frac{33}{65}$

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

8) No solution

9) $\left\{\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}\right\}$

10) $\frac{\pi}{2}, \frac{5\pi}{6}, \frac{11\pi}{6}$

11) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$