

Chapter 6 Test

Multiple Choice

For #1 to #5, choose the best answer.

- Simplify the expression $\frac{\cot^2 \theta}{1 + \cot^2 \theta}$.
 A $\cos^2 \theta$ B $\sin^2 \theta$
 C $\tan^2 \theta$ D $\sec^2 \theta$
- The value of $(\sin x - \cos x)^2 + \sin 2x$ is
 A -1 B 0
 C 1 D 2
- The expression $\frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$ is equivalent to
 A $\cos 2\theta$ B $\sin 2\theta$
 C $\cos^2 \theta$ D $\sin^2 \theta$
- If you simplify $\sin(\pi + x) + \sin(\pi - x)$ it is
 A -2 B 0
 C 2 D not possible
- Which of the following is *not* an identity?
 A $\sec \theta - \cos \theta = \sin \theta \tan \theta$
 B $1 - \cos^2 \theta = \cos^2 \theta \tan^2 \theta$
 C $\csc \theta - \cos \theta \tan \theta = \frac{\cos \theta}{\tan \theta}$
 D $\cos^2 \theta = \frac{1 - \cos 2\theta}{2}$

Short Answer

- Determine the exact value of $\sin\left(-\frac{5\pi}{12}\right)$.
- Given $\frac{\sin^2 x}{1 - \cos x} = 1.23$.
 What is the value of $\cos x$?
- If $5 - 7 \sin \theta - 2 \cos^2 \theta = 0$ on the domain $90^\circ \leq \theta \leq 180^\circ$, what is the value of θ ?

- If $\cos \theta = \frac{-5}{13}$, $\pi \leq \theta \leq \frac{3\pi}{2}$, determine the exact value of $\sin\left(\theta - \frac{\pi}{2}\right)$.

- What single trigonometric function is equivalent to

$$\sin(3y) \cos\left(\frac{y}{2}\right) - \cos(3y) \sin\left(\frac{y}{2}\right) ?$$

Extended Response

- Consider the equation

$$\sin\left(x + \frac{\pi}{2}\right) = \csc x - 1$$

- Verify the equation is true for $x = \frac{\pi}{2}$.
- Is the equation an identity? Explain.

- Consider the equation

$$\sin^2 x + \cos^4 x = \cos^2 x + \sin^4 x.$$

- Verify the equation for $x = 30^\circ$.
- Prove the equation is an identity.

- Consider the equation

$$\frac{\tan x + \sec x}{\cot x} = \frac{\sin x}{1 - \sin x}.$$

- State the non-permissible values on the domain $0^\circ \leq x \leq 360^\circ$.
- Prove the equation is an identity algebraically.

- Solve $\sin 2x - \cos x = 0$ algebraically for the domain $-\pi \leq x \leq \pi$.

- Solve $\csc^2 x = 4 \cot^2 x$ algebraically. State the general solution in radians.

