1. Determine the amplitude of the function \( y = \frac{4}{7} \cos(x) \). Also, choose its graph.

The amplitude is \( \square \).

Which is the correct graph of the equation on the interval \([-2\pi, 2\pi]\)?

\[ \text{A.} \quad \text{B.} \quad \text{C.} \quad \text{D.} \]

\[ \begin{array}{c}
\text{\includegraphics[width=0.2\textwidth]{graphA}} \\
\text{\includegraphics[width=0.2\textwidth]{graphB}} \\
\text{\includegraphics[width=0.2\textwidth]{graphC}} \\
\text{\includegraphics[width=0.2\textwidth]{graphD}}
\end{array} \]

Answers \( \frac{4}{7} \)

D

2. Graph one period of the given function.

\( y = \sin \left( x - \frac{3\pi}{2} \right) \)

Choose the graph of \( y = \sin \left( x - \frac{3\pi}{2} \right) \).

\[ \text{A.} \quad \text{B.} \quad \text{C.} \quad \text{D.} \]

\[ \begin{array}{c}
\text{\includegraphics[width=0.2\textwidth]{graphA}} \\
\text{\includegraphics[width=0.2\textwidth]{graphB}} \\
\text{\includegraphics[width=0.2\textwidth]{graphC}} \\
\text{\includegraphics[width=0.2\textwidth]{graphD}}
\end{array} \]

Answer: A
3. Find the graph of the given function.

\[ y = \cot \left( x + \frac{\pi}{6} \right) \]

Choose the correct graph below.

- **A.**
- **B.**
- **C.**

Answer: C

4. Graph each defined function over a one-period interval.

\[ y = \csc \left( x + \frac{3\pi}{5} \right) \]

Choose the correct graph.

- **A.**
- **B.**
- **C.**
- **D.**

Answer: A
5. Find $\sin \theta$.

$$\sec \theta = \frac{4}{3}, \tan \theta < 0$$

$\sin \theta = \square$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

Answer: $-\frac{\sqrt{7}}{4}$

6. Write the expression in terms of sine and cosine, and then simplify so that no quotients appear in the final expression.

$$\sin^2 \theta (1 + \cot^2 \theta)$$

Choose the correct answer below.

OA. $\sec^2 \theta$

OB. $-1$

OC. $\cot^2 \theta$

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

OE. 1

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

Answer: E

7. Let $\cos x = \frac{1}{9}$. Find all possible values of $\frac{\sec x - \tan x}{\sin x}$.

$$\frac{\sec x - \tan x}{\sin x} = \square$$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: $\frac{81\sqrt{5} - 180}{20}, \frac{-81\sqrt{5} - 180}{20}$
8. Simplify the trigonometric expression.

\[ \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} \]

Which of the following is the correct simplification of the trigonometric expression?

- O A. \((\sec x)(\csc x)\)
- O B. \(\frac{2(\sin x)(\cos x)}{\sin^2 x + \cos^2 x}\)
- O C. 1

Answer: A

9. The expression below simplifies to a constant, a single function, or a power of a function. Use fundamental identities to simplify the expression.

\[ \frac{\sin^2 x}{\cos^2 x} + \tan x \cot x \]

\[ \frac{\sin^2 x}{\cos^2 x} + \tan x \cot x = \]

Answer: \(\sec^2 x\)

10. Complete the identity.

\[ \frac{-\sin^2 \beta + 1}{\cos \beta} = \]

Choose the correct answer below.

- O A. \(-\sin \beta\)
- O B. \(\sin \beta\)
- O C. \(\cos \beta\)
- O D. \(\csc \beta\)
- O E. \(-\csc \beta\)
- O F. \(\sec \beta\)
- O G. \(-\sec \beta\)
- O H. \(-\cos \beta\)

Answer: C
11. Complete an identity for \( \cos^4(x) - \sin^4(x) \).

Choose the correct identity.
- OA. \( \cos^4(x) - \sin^4(x) = 4\cos(x) - 4 \sin(x) \)
- OB. \( \cos^4(x) - \sin^4(x) = \sin^2(2x) \)
- OC. \( \cos^4(x) - \sin^4(x) = 1 \)
- OD. \( \cos^4(x) - \sin^4(x) = 1 - 2 \sin^2(x) \)

Answer: D

12. Use appropriate identities to find the exact value of the expression.
\( \cos(-105^\circ) \)

What is the exact value of \( \cos(-105^\circ) \)?
- OA. \( \frac{-\sqrt{2} + \sqrt{6}}{4} \)
- OB. \( \frac{\sqrt{2} + \sqrt{6}}{4} \)
- OC. \( \frac{-\sqrt{2} - \sqrt{6}}{4} \)
- OD. \( \frac{\sqrt{2} - \sqrt{6}}{4} \)

Answer: D

13. Use a sum or difference formula to find the exact value of the trigonometric function.
\( \sin 75^\circ \)

\( \sin 75^\circ = \square \)

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

Answer: \( \frac{1}{4}(\sqrt{6} + \sqrt{2}) \)

14. Use a double-angle formula to find the exact value of the given expression.
\( 2 \cos^2 15^\circ - 1 \)

\( 2 \cos^2 15^\circ - 1 = \square \)

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

Answer: \( \frac{\sqrt{3}}{2} \)
15. Find the exact value of $\tan 75^\circ$ using the half-angle identity. Support your answer with a calculat approximation.

$\tan 75^\circ = \boxed{\text{value}}$

(Type an exact answer, using radicals as needed. Type N if the function is undefined.)

Answer: $2 + \sqrt{3}$