1) Verify that the following is an identity:
   \[ \sin^2 x = \frac{1}{2} (1 - \cos 2x) \]

2) Verify that the following is an identity:
   \[ (\sin x + \cos x)^2 = 1 + 2 \sin x \]

3) Write as a sum (you can verify by graphing):
   \[ y = \sin 3m \cdot \cos m \]

4) Verify that the following is an identity:
   \[ \frac{\sin 2t + \sin 4t}{\cos 2t - \cos 4t} = \cot t \]

5) Solve the following to four decimal places:
   \[ 2 \sin x = \cos 2x \]

6) Solve the triangle with sides:
   \[ a = 4m, b = 10.2m, c = 9.05m \]

7) Solve the triangle with the following:
   \[ \alpha = 122^\circ, \gamma = 18^\circ, b = 12km \]

8) Sketch the graph of:
   \[ r = 4 \]

9) Sketch the graph of:
   \[ \Theta = \frac{\pi}{3} \]

10) Write the exponential equation in logarithmic form: \[ 32^{2/5} = 4 \]

11) Solve the equation for \( x \).
    \[ e^{x^2 + 8} = e^{6x} \]

12) Find the domain, intercepts, and asymptotes of the logarithmic function and sketch its graph:
    \[ h(x) = \log_2(x - 4) \]

13) Approximate the logarithm using the properties of logarithms, given:
    \[ \log_b 2 = 0.3562 \text{ and } \log_b 3 = 0.5646. \]
    \[ \log_b(3/4) \]
15) Condense the expression to the logarithm of a single quantity.

\[ 3 \ln(7) + 5 \ln(z - 9) \]

16) Convert the angle measure 65° from degrees to radians. Round to three decimal places.

17) Find three values for \( \theta \) that make the statement true:

\[ \theta = \left( \frac{1}{2}, \frac{\sqrt{3}}{2} \right) \]

18) Find the exact values for:

\[ \sin \frac{5\pi}{6} = \]

\[ \cos \frac{\pi}{6} = \]

19) Use the given function values and the trigonometric identities to find the exact value of each indicated trigonometric function.

\[ \sin(\alpha) = \frac{12}{13} \]

\[ \sin(\alpha) = \quad \cos(\alpha) = \]

\[ \tan(\alpha) = \quad \cot(\alpha) = \]

\[ \csc(\alpha) = \quad \sec(\alpha) = \]

20) Solve exactly for all values of Theta on [-2\( \pi \), 2\( \pi \)] where \( \sin \Theta = 1 \)

21) Solve exactly for all values of Theta on [-2\( \pi \), 2\( \pi \)] where \( \tan \Theta = -1 \)

22) State the period and amplitude for \( y = 4 \sin 3x \)

23) Sketch the graph of \( y = \arcsin x \) and give the domain and range.

Period:

Amplitude:
24) Verify the identity:
\[
\frac{\cos^2\left(\frac{\pi}{2} - x\right)}{\cos(x)} = \sin(x) \tan(x)
\]

25) State the quadrant in which \( \theta \) lies when: 
\( \sin \theta < 0 \) and \( \cos \theta > 0 \)

Use a calculator to evaluate the trigonometric function. Round your answer to four decimal places.

\[ \sec 225^\circ = \] ________

26) Verify the identity:
\[ 9 \cos(t) + 9 \sin(t) \tan(t) = 9 \sec(t) \]

27) Verify the identity (Hint: try factoring):
\[ 9 \cos^2 \beta - 9 \sin^2 \beta = 9 - 18 \sin^2 \beta \]

28) Approximate (to three decimal places) the solutions of the equation in the interval [0, 2\( \pi \)].

\[ 4 \tan^2(x) = 19 \]

29) Solve the equation.

\[ 10 \cos^2(x) + 5 \cos(x) - 5 = 0 \]

30) Verify the identity.

\[ \sec(x) - \cos(x) = \sin(x) \tan(x) \]

31) Find the exact values of the sine, cosine, and tangent of the angle \( \frac{11\pi}{12} = \frac{3\pi}{4} + \frac{\pi}{6} \)

32) Solve for a triangle given
\[ a = 51 \text{ m} \quad A = \]
\[ b = \quad B = 20^\circ 30' \]
\[ c = 41 \text{ m} \quad C = \]