Phys251 MathQuiz W03

Show your work

Name: ____________________________

SSN: ____________________________

1. Solve the following system of equations and find $x$ and $y$:
\[
\begin{align*}
  x + 3y & = 5 \\
  4x - 8y & = 0 
\end{align*}
\]

2. Find the two roots of the following equation: $2x^2 - 4x - 70 = 0$

3. For the following right triangle, determine angle $\alpha$, angle $\beta$, and hypotenuse $c$.

4. Perform the following definite integral:
\[
\int_0^5 (x^2 + 5s + 3) \, dx = ?
\]
5. What is the slope of the line determined by the following equation at point \( x = 3 \)? (hint: take a derivative) At what value of \( x \) does \( y \) have a minimum?

\[
y = 3x^2 - 4x + 5
\]

6. What is the derivative of the function \( \sin x \)?
   What is its second derivative?

7. Draw a graph of the functions \( e^x \) and \( \ln x \) (exponential and natural logarithm). Indicate where these functions cross the coordinate axes. Do these functions exist for all values of \( x \)?