Problem 1 Find all solutions to the equations. No calculator is allowed.

\[ 2 \cos^2(x) + 5 \sin(x) = 4 \]
Problem 2 Find all solutions to the following equation. No calculator is allowed.

$$2 \cos(x) = 3 \tan(x)$$
Problem 3 Compute \( \sin(\arctan(\frac{4}{3})) \) without a calculator.
**Problem 4** Find all solutions to the following equation without a calculator. You may use inverse trig function to represent your answer.

\[ \tan^2(x) - 7 \tan(x) + 12 = 0 \]