(1) (10 points) Prove the following identity:
\[
\frac{\cos^3 x - \sin^3 x}{\cos x - \sin x} = \frac{2 + \sin(2x)}{2}
\]

(2) (15 points) Sketch one period of the graph \( y = 40 \sin \left( \frac{1}{3}x - \frac{\pi}{12} \right) \). Label the lowest points, the highest points and the x-intercepts of the graph with their coordinates.

(3) (10 points) Solve the following triangle: \( a = 3\text{cm}, b = 4\text{cm}, c = 6\text{cm} \).

(4) (10 points) Solve the following triangle: \( a = 3\text{cm}, b = 4\text{cm}, C = 62^\circ \).

(5) (10 points) Solve the following triangle: \( a = 5\text{cm}, b = 5\text{cm}, A = 0.9 \text{ radians} \).

(6) (10 points) Simplify \( \sin(\arctan(x/2)) \).

(7) (15 points) Find all solutions that are in \([0, 2\pi)\) of the equation
\[
4\sin^2 x - 3 = 0
\]

(8) (15 points) Consider the complex number \( z = 1 - \sqrt{3}i \).
(a) Write \( z \) in trigonometric form as \( z = r(\cos(\phi) + i\sin(\phi)) \).
(b) Compute \( z^2 \) in two ways: with \( z \) in the normal form and with \( z \) in trigonometric form. Show that both results are the same.
(c) Use de Moivre’s Theorem to compute \( z^{10} \). Write your result as a complex number in normal form.