1. Find all solutions of the following equations.

(a) \( \tan x = \sqrt{3} \)

(b) \( \cos(3t) = -\frac{1}{2} \)
2. Find the solutions in the interval \([0, 2\pi]\) to the following equations.

(a) \(\cos x = \cos 3x\)
(Hint: Use a sum-to-product formula).

(b) \(\cos 5t \cos 3t = \frac{1}{2} + \sin(-5t) \sin 3t\)
(Hint: Use an addition or subtraction formula.)

(c) \(\sin^2 \theta - \sin \theta = 0\).

(d) \(2 \sin^2 t + 3 \sin t + 1 = 0\)
(7) 3. Find the exact value of $\cos 75^\circ$.
(Use $75 = 30 + 45$.)

(10) 4. Let $\alpha$ and $\beta$ be numbers between $\frac{\pi}{2}$ and $\pi$, with $\cos \alpha = -\frac{1}{3}$ and $\sin \beta = \frac{2}{5}$. Find the exact value of $\sin(\alpha + \beta)$.

(9) 5. Use an inverse trig function to find the approximate solution (to three decimal places) in $[0, \pi)$ to the equation $(2 \tan t + 1)(\tan t - 3) = 0$. 
(20) 6. Find the exact values of each of the following expressions, provided that the expression makes sense. Otherwise, state that the expression is undefined.

(a) \( \sin \left( \sin^{-1} \frac{3\pi}{4} \right) \)

(b) \( \sin^{-1} \left( \sin \frac{3\pi}{4} \right) \)

(c) \( \sin \left( \tan^{-1}(-3) \right) \)

(d) \( \cos \left( 2 \sin^{-1} \frac{4}{5} \right) \)