

1. Evaluate

$$\sec(\arccos(\frac{8}{17}) - \arctan(-\frac{4}{3}))$$

2. Assuming all angles are in the first quadrant, rewrite the following trigonometric function to an algebraic function. Find the domain of the function  $f(x)$

$$f(x) = \sin(\arcsin x + \arctan x)$$

3. Solve for  $x$  if  $x \in [0, 2\pi)$

$$\sin\left(x + \frac{\pi}{4}\right) + \sin\left(x - \frac{\pi}{4}\right) = \frac{\sqrt{6}}{2}$$

4. Solve for  $x$  if  $x \in [0, 2\pi)$

$$2\sec x = \tan x - 2$$

5. Verify the following identity

$$\frac{\sin x}{\tan x} + \frac{\cos x}{\cot x} = \sin x + \cos x$$

6. Evaluate  $\cos \frac{7\pi}{12}$  without a calculator.