Spring 2025 Laird Homework 2

Please note that a calculator is not required for any of the following questions, and is discouraged. If you are using a calculator, you are doing it wrong. Use your unit circle knowledge.

1. Find the exact value of $\sin(\frac{5\pi}{12})$. Do not give a decimal approximation!
2. Find the exact value of $\cos(\frac{7\pi}{12})$. Do not give a decimal approximation!
3. Find the exact value of $\cos(\frac{-7\pi}{12})$. Do not give a decimal approximation!
4. Let x and y be angles in standard position. If $\sin(x) = \frac{3}{5}$ and $\cos(y) = -\frac{1}{2}$ where x is in Quadrant I and y is in Quadrant II, find:
   (a) $\sin(x + y)$
   (b) $\cos(x - y)$
5. Find all values of x in the interval $[0, 2\pi]$ that satisfy both inequalities:
   - $\cos(x) < -\frac{\sqrt{2}}{2}$
   - $2\sin(x) < 1$
6. Find all values of x in the interval $[-\pi, \pi]$ that satisfy both inequalities:
   - $\sin(x) > \frac{\sqrt{3}}{2}$
   - $\cos(x) > -\frac{1}{2}$
7. Find all values of x in the interval $[10\pi, 14\pi]$ that satisfy $\sin(x) = \frac{1}{2}$
8. Find all values of x in the interval $[-7\pi, -3\pi]$ that satisfy $\cos(x) = -\frac{\sqrt{2}}{2}$
9. At what x-value(s) in $[0, 3\pi]$ does $\tan(x)$ have vertical asymptotes?
10. How many times does $y = \sin(x)$ intersect $y = \cos(x)$ in the interval $[0, 2\pi]$? (*Hint: Practice graphing sin and cos*)