1. Find the domain and range of each of the following functions.

(a) \( f(x) = \arccos x \)  \hspace{1cm} (d) \( f(x) = \csc^{-1} x \)

(b) \( f(x) = \arcsin x \)  \hspace{1cm} (e) \( f(x) = \arctan x \)

(c) \( f(x) = \sec^{-1} x \)  \hspace{1cm} (f) \( f(x) = \cot^{-1} x \)

(g) \( f(x) = \arcsin(4x) + \pi \)
2. Give angles in radians satisfying the following properties

(a) An angle in the second quadrant coterminal with \( \frac{2\pi}{3} \)
(b) A negative angle coterminal with \( \frac{7\pi}{6} \)
(c) An angle larger than \( 4\pi \) that is coterminal with \( -\frac{\pi}{4} \)
(d) An angle less than \( -12\pi \) that is coterminal with \( -\frac{2\pi}{3} \)

3. (a) Suppose a function with period \( 2\pi \) attains a maximum value of 100 and a minimum value of 20. If the function has the form \( f(x) = A \sin x + B \) what must \( A \) and \( B \) be?

(b) Suppose that, in addition to the above, the function satisfies the initial condition that \( f(0) = 20 \). Can the function still be written as \( f(x) = A \sin x + B \)? If not, how can you change \( f \) to satisfy this?

4. For the graph below, determine a cosine function and a sine function that produces the graph
5. Sketch at least two periods of \( f(x) = \tan(x - \frac{\pi}{4}) + 2 \)

6. Find the following values

   (a) \( \arcsin(1) \)  
   (b) \( \cos(\arcsin(\frac{1}{3})) \)  
   (c) \( \sin(\arctan(\frac{5}{12})) \)  
   (d) \( \tan(\arcsin(-\frac{3}{4})) \)  
   (e) \( \cos^{-1}(\cos(\frac{3\pi}{2})) \)  
   (f) \( \csc(\arcsin(\frac{1}{3})) \)
7. Find all values of $x$ where $\sin x$, $\cos x$, $\tan x$ are zero or undefined.

8. Use the unit circle to explain why $\sin\left(\frac{\pi}{2} - x\right) = \cos x$

9. Solve the equation $1 - 2\sin^2 \theta = 2 - 2\sin \theta$. Hint: write it as a quadratic “in disguise”.

10. Simplify and find the domain of $f(x) = \tan(\arccos(2x))$.

An Ending Thought: A goal is a dream with a deadline.

– Napoleon Hill