PROBLEM:

Let $x(t) = 9\sin(52.5\pi t)$. The discrete-time signal $x[n]$ is obtained by sampling $x(t)$ at a rate f_s; and the resulting $x[n]$ can be written as:

$$x[n] = A\cos(\omega_0 n + \phi)$$

(a) If the sampling frequency is $f_s = 30$ samples/sec, determine the values of A, ϕ and ω_0. In addition, state whether or not the signal has been oversampled or undersampled.

(b) Make a plot of the rotating phasor $Ae^{j\phi}e^{j\omega_0 n}$ for $n = 0, 1, \ldots, 10$. Use the values of A, ϕ and ω_0 from part (a).