PROBLEM:

For the following short answer questions, write your answers in the space provided or circle the correct answer:

(a) The signal $x(t) = \cos(100\pi t) + \sin(101\pi t) - \cos(102\pi t)$ is

(i) periodic with period equal to 1/100 sec.

(ii) periodic with period equal to 1/50 sec.

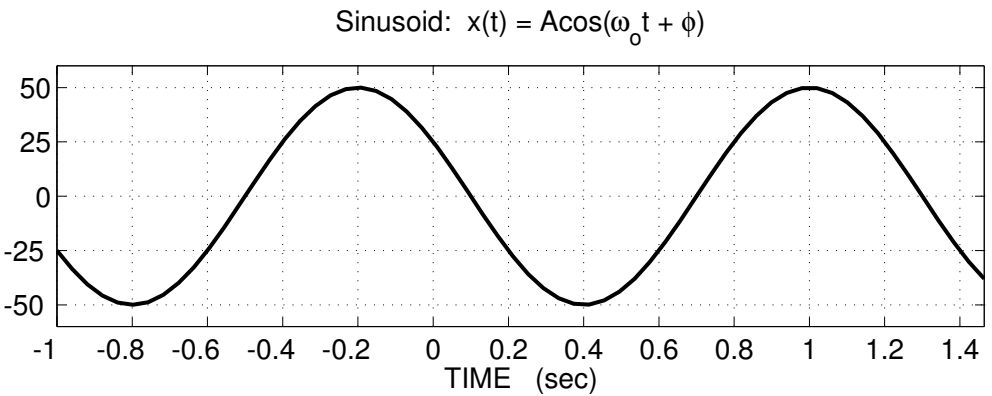
(iii) periodic with period equal to 2 sec.

(iv) periodic with period equal to 1 sec.

(v) periodic with period equal to $\frac{1}{2}$ sec.

(b) **TRUE** or **FALSE**: "Suppose that the signal $x(t)$ is a *single frequency* sinusoid and its spectrum has frequency components only at $f = \pm 2$ Hz. If a new signal is defined by $y(t) = x(t - \frac{1}{2})$ then $y(t)$ has frequency components at the same frequencies **but** the complex amplitudes are different." EXPLAIN.

(c) In the figure below determine the phase of the sinusoid. Write your answer here: $\phi =$ _____



(d) In the figure above determine the frequency (ω_0) in radians/sec. Circle the correct answer.

(A) $5\pi/3$ **(B)** $5\pi/6$ **(C)** $5\pi/12$ **(D)** $5/6$ **(E)** 2.4π