QUIZ #1

(1) Three pairs of simple harmonic oscillators are shown below. They use identical springs and masses and were given the same amplitude. For each pair, indicate a possible value for the phase difference between them.

\[ \Delta \phi = _______ \]  
\[ \Delta \phi = _______ \]  
\[ \Delta \phi = _______ \]

(2) A particle executes simple harmonic motion according to: \( x = x_m \cos(\omega t + \phi_0) \) with \( x_m = 0.020 \) m, \( \omega = 250 \) rad/s. Also, \( v = 0 \) m/s at \( t = 0.010 \) s.

(a) What is its maximum speed?
(b) How long must you wait after \( t = 0.010 \) s for the acceleration to reach its maximum magnitude?
(c) Find two possible values for the phase constant, \( \phi_0 \).