

1.

$T = 2 \text{ sec}$  - read from graph

$\omega = \frac{2\pi}{T} = \frac{2\pi}{2} = \underline{\underline{3.14 \text{ Hz}}}$  (A)

~~scribble~~  $\omega = \sqrt{\frac{k}{m}}$

$k = \omega^2 m = (3.14)^2 (.250) = \underline{\underline{2.47 \text{ N/m}}}$  (B)

$v_{\text{max}} = 5$  - read from graph

$v_{\text{max}} = \omega A \quad 5 = (3.14)A$

$\underline{\underline{A = 1.59 \text{ m}}}$  (C)

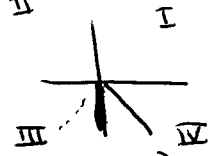
$x = A \cos(\omega t + \phi)$

$v = -A\omega \sin(\omega t + \phi)$

$4 = -5 \sin(\phi)$

$\sin^{-1}(\frac{4}{5}) = \phi$

$\phi = -.927$



$v(t=0) = 4$  from graph

$\rightarrow a = -A\omega^2 \cos(\omega t + \phi)$

slope is neg at  $t=0$   
from graph

$= -A\omega^2 \cos(\phi)$

$\underline{\underline{x = 1.59 \cos(3.14t - .927)}}$  (D)

$\phi = -0.927$  is positive speed IV quadrant