Name Minc Date

Math 112: Quiz 5.6:

1. Find a function that models the simple harmonic motion having the given properties: Amplitude = $9m$, Period = $6sec$. Assume that the displacement is at its minimum at time = 0.

+1 $y = -9\cos\frac{\pi}{3}t$ ↑ $-\cos$

$\omega \cdot 6 = 2\pi$

$\frac{\omega 6}{6} = \frac{2\pi}{6} = \frac{\pi}{3}$

2. Find a function that models the damped harmonic motion with an initial amplitude of 100, a damping constant of 0.05 and a frequency of 4. Use the form: $y = ke^{-ct}\cos(\omega t)$. (Graph the function for extra credit. Label your axes)

$k = 100$

$c = 0.05$

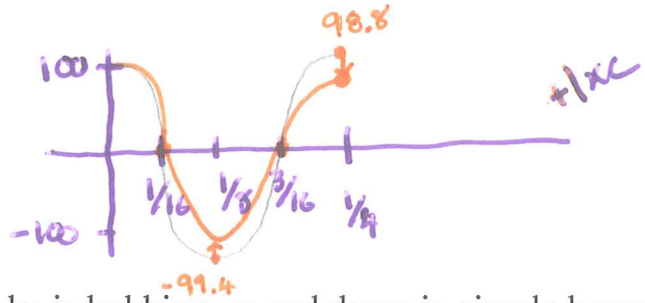
$f = 4$

$2\pi \cdot 4 = \frac{\omega}{2\pi} \cdot 2\pi$

$8\pi = \omega$

$y = 100^{-0.05t}\cos(8\pi t)$ +1

$P = \frac{1}{4}$



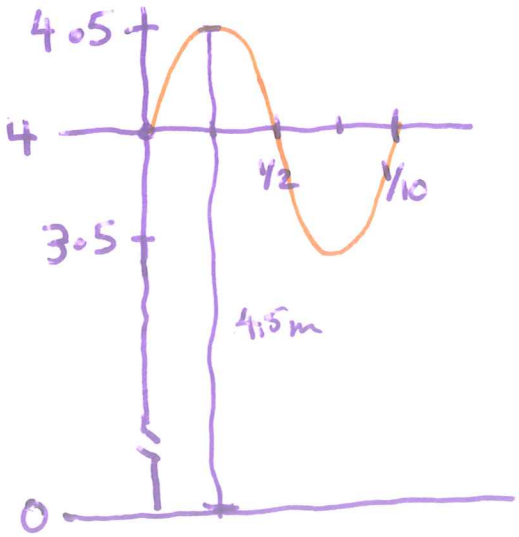
3. A cork floating near the shore in a lake is bobbing up and down in simple harmonic motion. Its displacement above the bottom of the lake is modelled by:

$y = 0.5\sin(20\pi t) + 4$ ↑4 where y is in meters and t is in minutes

a) Find the frequency and period of the motion of the cork.

b) Sketch the Graph of y. (label your axes)

c) Find the maximum displacement of the cork above the lake bottom. ← 4.5m

$f = \frac{20\pi}{2\pi} = 10$

$P = \frac{2\pi}{20\pi} = \frac{1}{10}$