

Even Non-Bold

Answers

§ 5.1

10) $x(t) = -\frac{1}{3} \cos 5t + \frac{4}{3} \sin 5t$

a) $x(t) = \frac{5}{12} \sin(5t - 0.927)$

b) $x(t) = \frac{5}{12} \cos(5t - 2.498)$

28) a) $x(t) \neq 0$ for any t .

Extreme displacement
is $x(0) = 1 \text{ m}$

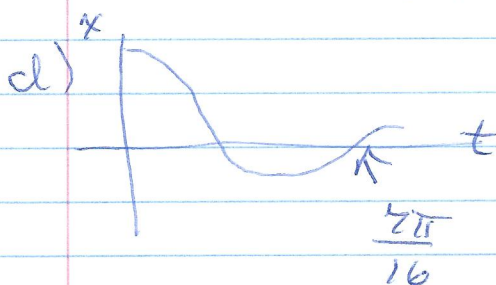
b) $x'(t) = 0$ at
 $t \approx 0.384 \text{ s}$

Extreme displacement
is $x(0.384) = -0.232 \text{ m}$

30) a) $x(t) = e^{-2t} \left(\frac{1}{2} \cos 4t + \frac{1}{2} \sin 4t \right)$

b) $x = \frac{1}{\sqrt{2}} e^{-2t} \sin(4t + \frac{\pi}{4})$

c) $t = \frac{7\pi}{16} + \frac{\pi}{2} n,$
 $n = 0, 1, 2, \dots$



34) a) $x(t) = e^{-t} \cos 2t + 3 \sin 2t$

b) transient state :
 $e^{-t} \cos 2t$

Steady-state

$3 \sin 2t$

42)

$x(t) = 2 \cos 3t + \frac{5}{18} \sin 3t$
 $- \frac{5}{6} t \cos 3t$

§ 7.1

12) $\mathcal{L} \{ e^{-2t-5} \}$

$= \frac{e^{-5}}{s+2}, \quad s > -2$

32)

$\mathcal{L} \{ f(t) \} = \frac{1}{s^2+25} + \frac{2}{s^2+4}$