Ben Ridenbaugh HW 15

9-20. $v(0)=0$ $x(0)=0$ ∴ no constants

a. $a(t)=6t^3-4t^2+7t-8$ m/s²

$\therefore v(t)=\frac{3}{2}t^4-\frac{4}{3}t^3+\frac{7}{2}t^2-8t$ m/s

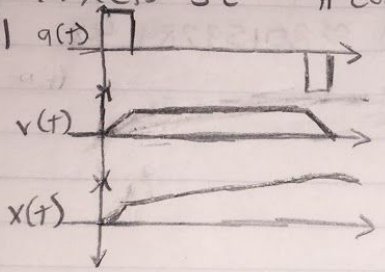
$\therefore x(t)=\frac{3}{10}t^5-\frac{1}{3}t^4+\frac{7}{6}t^3-4t^2$ m

b. $a(t)=5e^{-5t}+\frac{\pi}{4}\cos(\frac{\pi}{4}t)$ m/s²

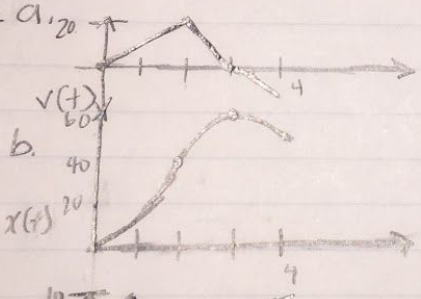
$\therefore v(t)=-e^{-5t}+\sin(\frac{\pi}{4}t)$ m/s

$\therefore x(t)=\frac{1}{5}e^{-5t}-\frac{4}{\pi}\cos(\frac{\pi}{4}t)$ m

9-21



9-22 a.



$v(0)=0$

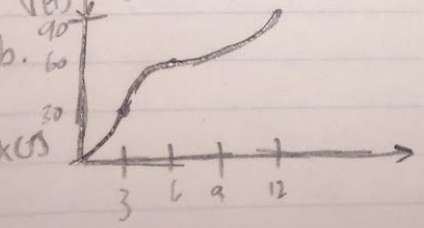
b.

$x(0)=0$

9-23. a.

$v(0)=0$

b.



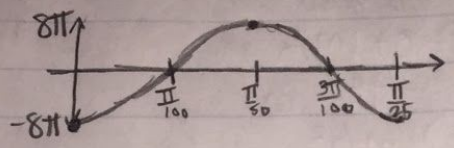
$x(0)=0$

9-25 $i(t)=(t-1)^2=t^2-2t+1$ $q(0)=0$

$q(t)=\int i(t)=\frac{1}{3}t^3-t^2+t$

-36. $a(t) = 400\sin(50\pi t)\ m/s^2$

a. $v(t) = -8\pi\cos(50\pi t)\ m/s$ * no c because $v(0) = 0$ *



b. $v(.02) = -8\pi\cos(50\pi(.02)) \approx 25.13\ m/s$

c. $I = m(V_f - V_0) \leftarrow 0$

$= 1200000g(25.13\ m/s) \approx 30159289.48$