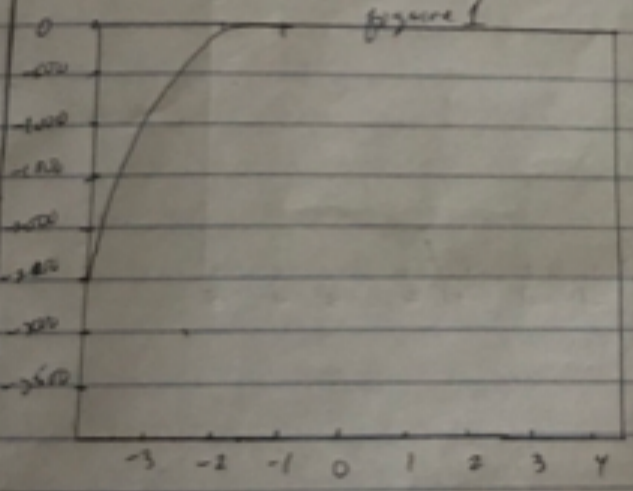
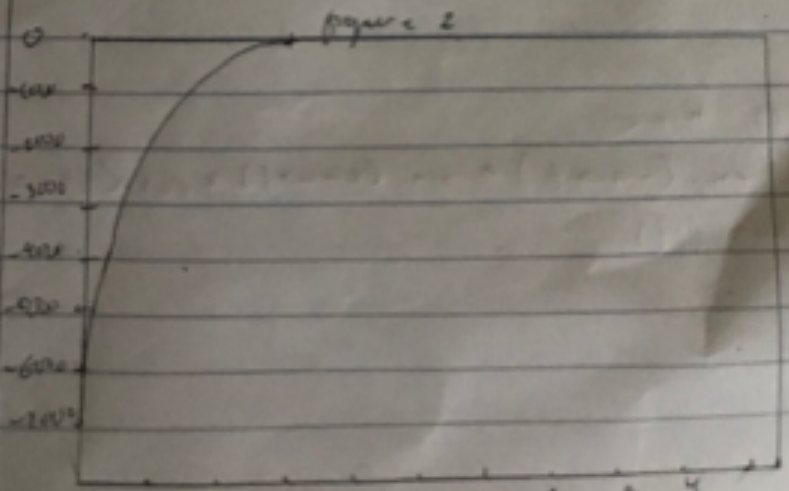
b)ii) Python

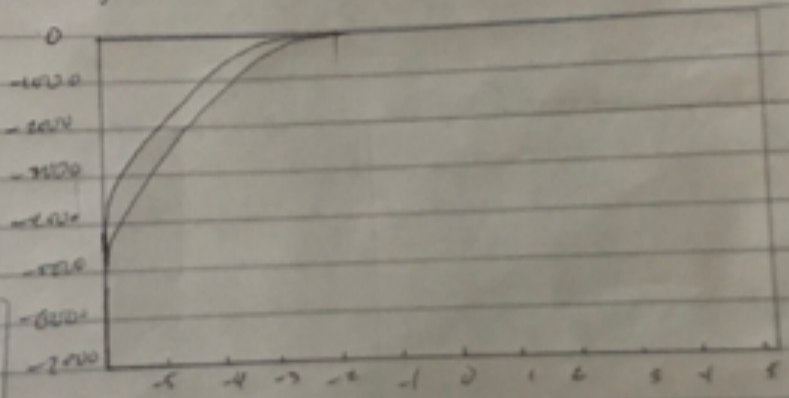
```
commandwindow
clear
clc
syms y(t) x(t)
ode1 = diff(y,t) - 2*x == exp(-2*t)
ode2 = diff(x,t) + y == exp(-t)
ode = [ode1, ode2]
cond = [y(0) == 0, x(0) == 0]
[yeq, xeq] = dsolve(ode, cond)
fplot(yeq)
grid on
grid minor
figure 2
fplot(xeq)
grid on
grid minor
```





6.) together

```
command window
clear
clc
syms y(t) x(t)
ode1 = diff(y,t) - 2*x == exp(-2*t)
ode2 = diff(x,t) + y == exp(-t)
odes = [ode1, ode2]
cond = [y(0)==0, x(0)==0]
[yeq, xeq] = dsolve(odes, cond)
fplot(yeq)
hold on
fplot(xeq)
grid on
grid minor
```



c) $f(t) = ke^{-at}\sin(\omega t)$

```
command window
clear
clc
syms k a w t
f(t) = k*exp(-a*t)*sin(w*t)*cos(3*w*t)
F = laplace(f(t))
```

```
command window
clear
```

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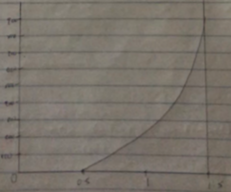
ENG 381 Assignment IV

Test Question No. 9

a

```
commandwindow
clear
clc
syms (n) t
dn = diff (n,t)
ode = diff (n,t,2)- diff (n,t)- i2*n = 144*(t^3)+m
cond2 = n(0) == 5
cond3 = dn(0) == -0.5
conds = [cond2, cond3]
nsol(t) = dsolve(ode,conds)
tn = 0:0.1:1.5
temp = subs (nsol(t), tn)
plot (tn, temp)
axis tight
grid on
grid minor
```



```
clc
syms s
fs = pi / ((s^2) + (15 * pi * s) + (24 * pi^3))
ft = laplace(fs)
```