NWADIKE REGINALD-FRANCIS CHUKWUMA

17/ENG02/052

COMPUTER ENGINEERING

300 LEVEL

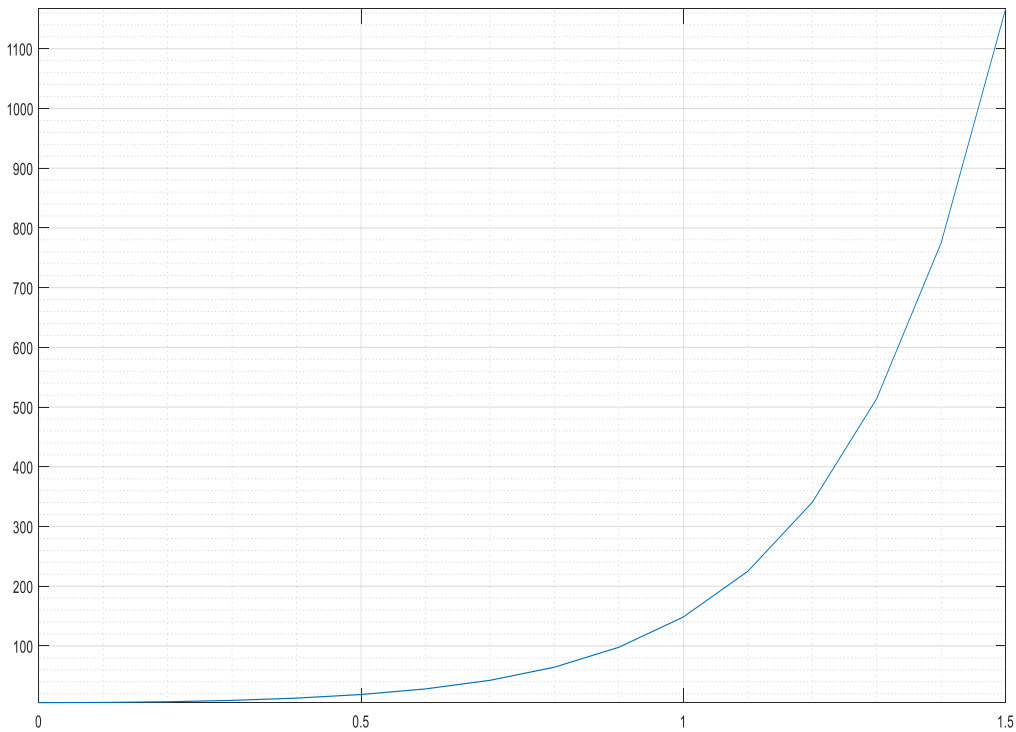
ENG 381 – ENGINEERING MATHEMATICS III

MID-SEMESTER TEST

SOLUTIONS

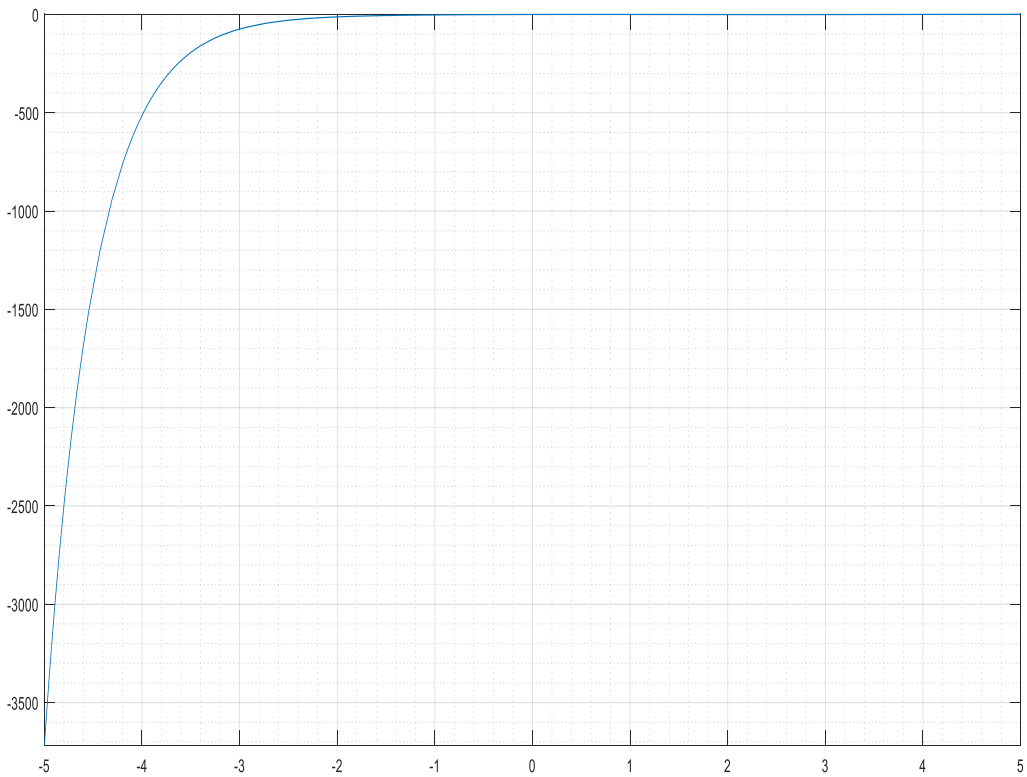
QUESTION 4A

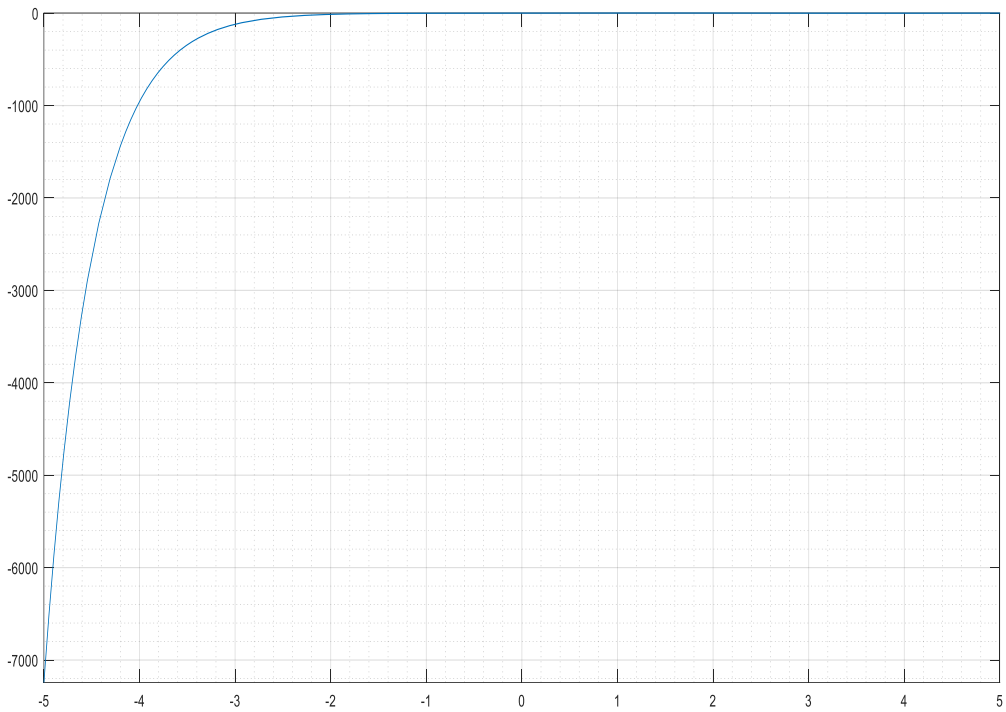
```
commandwindow
clear
clc
syms n(t)
D2n = diff(n,2)
Dn = diff(n)
reginald = [D2n-Dn-(12*n)==(144*(t^3))+12.5]
francis = [n(0)==5,Dn(0)==-0.5]
downtown = dsolve(reginald,francis)
t = 0:0.1:1.5
chukwuma = subs(downtown,t)
plot(t,chukwuma)
grid on
grid minor
axis tight
```



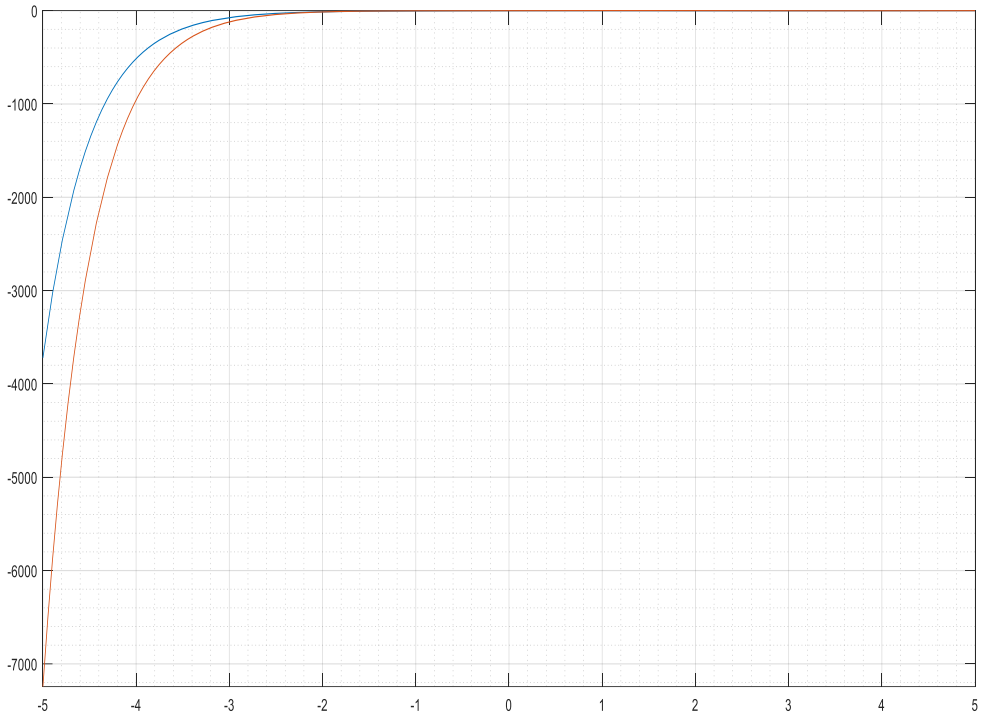
QUESTION 4B

```
Commandwindow
Clear
clc
syms y(t) x(t)
Dy = diff(y)
Dx = diff(x)
reginald1 = [Dy-(2*x)==exp(-2*t)]
reginald2 = [Dx+y ==exp(-t)]
reginald = [reginald1,reginald2]
francis = [y(0)==0,x(0)==0]
[yeq xeq] = dsolve(reginald,francis)
figure (1)
fplot (yeq)
grid on
grid minor
axis tight
figure (2)
fplot (xeq)
grid on
grid minor
axis tight
```






```
Commandwindow
Clear
clc
syms y(t) x(t)
Dy = diff(y)
Dx = diff(x)
reginald1 = [Dy-(2*x)==exp(-2*t)]
reginald2 = [Dx+y ==exp(-t)]
reginald = [reginald1,reginald2]
francis = [y(0)==0,x(0)==0]
[yeq xeq] = dsolve(reginald,francis)
fplot (yeq)
hold on
fplot (xeq)
grid on
grid minor
axis tight
```



QUESTION 4Ci

```
Commandwindow
Clear
clc
syms t w a k s
f(t) = (k*exp(-a*t))*sin(5*w*t)*cos(3*w*t)
downtown = laplace (f(t))
```

QUESTION 4Cii

```
Commandwindow
Clear
clc
syms s
f(s) = pi/((s^2)+(15*pi*s)+(24*(pi^3)))
downtown = ilaplace(f(s))
```