

## The Answer Of Exam D

1)

a)

```
>> abs(log2(0.5))*asin(0.79)/(8*exp(3)*2^(5))
```

```
ans =
```

```
1.7713e-04
```

b)

```
>> solve('x^3+5*x^2+1=0')
```

```
ans =
```

```
-1/6*(1108+12*1581^(1/2))^(1/3)-50/3/(1108+12*1581^(1/2))^(1/3)-  
5/3
```

```
1/12*(1108+12*1581^(1/2))^(1/3)+25/3/(1108+12*1581^(1/2))^(1/3)-5/3+1/2*i*3^(1/2)*(-  
1/6*(1108+12*1581^(1/2))^(1/3)+50/3/(1108+12*1581^(1/2))^(1/3))
```

```
1/12*(1108+12*1581^(1/2))^(1/3)+25/3/(1108+12*1581^(1/2))^(1/3)-5/3-1/2*i*3^(1/2)*(-  
1/6*(1108+12*1581^(1/2))^(1/3)+50/3/(1108+12*1581^(1/2))^(1/3))
```

c)

```
>>syms x y
```

```
>>factor(x^10-y^10)
```

```
ans =
```

```
(x-y)*(x+y)*(x^4+x^3*y+x^2*y^2+x*y^3+y^4)*(x^4-  
x^3*y+x^2*y^2-x*y^3+y^4)
```

```
2)
```

```
a)
```

```
%Newton Raphson method  
function x1=nw4(x0,tol)  
x1=x0-(f(x0)/fd(x0));  
while abs(x1-x0)>tol  
    x0=x1;  
    x1=x0-(f(x0)/fd(x0));  
end  
disp('the value of the root')  
disp(x1)
```

```
function r= f(x)  
r=x*exp(x)-2;  
end  
function d= fd(x)  
d=x*exp(x)+exp(x);  
end  
end
```

```
>> x1=nw4(0.5,0.00001)
```

```
the value of the root
```

0.8526

x1 =

0.8526

b)

```
>>c=solve('x*exp(x)=2')
```

c =

`lambertw(2)`

```
>>exact=vpa(c)
```

exact=

.85260550201372549134647241469532

c)

```
>>e=abs(x1-exact)
```

```
e =
```

```
.4445722853535960e-16
```

3)

a)

```
%Simpson method
function I=simp(x0,xn,n)
h=(xn-x0)/n;
s1 =0;
for i=1:2:n-1
    x=x0+i*h;
    s1 = s1 +f(x);
end
s2 = 0;
for i=2:2:n-2
    x=x0+i*h;
    s2 = s2+f(x);
end
I =(h/3)*(f(x0)+4*s1 +2* s2+f(xn));
function g=f(x)
g=sqrt(2*x^2+3*x);
```

```
>>I=simp(0,1,10)
```

```
I =
```

```
1.3591
```

b)

```
>>int('sqrt(2*x^2+3*x)',0,1)
```

ans =

$$\frac{9}{32} \cdot 2^{1/2} \cdot \log(3) + \frac{9}{64} \cdot 2^{1/2} \cdot \log(2) + \frac{7}{8} \cdot 5^{1/2} - \frac{9}{32} \cdot 2^{1/2} \cdot \log(7 \cdot 2^{1/2}) + 4 \cdot 5^{1/2}$$

```
>>exact=vpa(ans)
```

exact =

1.3635193298542486263785104840272

c)

```
>>e=abs(1-exact)
```

e =

.44201333688797052617229512171e-2