Integration

Degree to radian conversion

In [17]:

```
%%time
x=int(input("Enter the degree :"))
t=x*pi/180
t
```

```
Enter the degree :150
Wall time: 7.06 s
```

Out[17]:

$$\frac{5\pi}{6}$$

Radian to Degree conversion

In [19]:

```
import math
x=int(input("Enter the degree :"))
t=x*180/math.pi
t
```

```
Enter the degree :17
```

Out[19]:

```
974.0282517223995
```

Importing Library

In [22]:

```
import numpy as np
import matplotlib.pyplot as plt
import matplotlib as mlt
import pandas as pd
from sympy import *
```

In [2]:

```
x=Symbol('x')
y=((x**(3/2))+(2*exp(x))-(1/x))
integrate(y,(x))
```

Out[2]:

$$0.4x^{2.5} + 2e^{x} - \log(x)$$

In [3]:

```
integrate(sin(x)+cos(x),x)
```

Out[3]:

$$\sin(x) - \cos(x)$$

In [4]:

```
x=Symbol('x')
y=(sin(2*x+5))**2
integrate(y,x)
```

Out[4]:

$$\frac{x\sin^2(2x+5)}{2} + \frac{x\cos^2(2x+5)}{2} - \frac{\sin(2x+5)\cos(2x+5)}{4}$$

In [5]:

```
integrate(sin(3*x)*cos(4*x),x)
```

Out[5]:

$$\frac{4\sin(3x)\sin(4x)}{7} + \frac{3\cos(3x)\cos(4x)}{7}$$

In [6]:

```
integrate(sin(2*x+1)**3,x)
```

Out[6]:

$$-\frac{\sin^2(2x+1)\cos(2x+1)}{2} - \frac{\cos^3(2x+1)}{3}$$

In [7]:

```
integrate(cos(x)**2,(x,0,pi/2))
```

Out[7]:

$$\frac{\pi}{4}$$

In [8]:

```
integrate(sqrt(sin(x))/(sqrt(sin(x))+sqrt(cos(x))),x)
```

Out[8]:

$$\int \frac{\sqrt{\sin(x)}}{\sqrt{\sin(x)} + \sqrt{\cos(x)}}\, dx$$

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In [9]:

```
integrate(x*sqrt(2-x),(x,0,2))
```

Out[9]:

$$\frac{16\sqrt{2}}{15}$$

In [11]:

```
integrate(1/(x-x**3),x)
```

Out[11]:

$$\log(x) - \frac{\log\left(x^2 - 1\right)}{2}$$

In [12]:

```
integrate(2*tan(x)**3,(x,0,pi/4))
```

Out[12]:

$$2\log\left(\frac{\sqrt{2}}{2}\right) + 1$$

In [13]:

```
integrate(cos(2*x)/(sin(x)+cos(x))**2,x)
```

Out[13]:

$$\frac{2\tan\left(\frac{x}{2}\right)}{\tan^2\left(\frac{x}{2}\right) - 2\tan\left(\frac{x}{2}\right) - 1} + \frac{2\log(\sin(x) + \cos(x))\sin(x)}{2\sin(x) + 2\cos(x)} + \frac{2\log(\sin(x) + \cos(x))\cos(x)}{2\sin(x) + 2\cos(x)} + \frac{2\sin(x)}{2\sin(x) + 2\cos(}$$

In [14]:

```
integrate(atan((2*x-1)/(1+x-x**2)),(x,0,1))
```

Out[14]:

$$0$$

In [15]:

```
integrate(x**4/((x-1)*(x**2+1)),x)
```

Out[15]:

$$\frac{x^2}{2} + x + \frac{\log(x - 1)}{2} - \frac{\log\left(x^2 + 1\right)}{4} - \frac{\operatorname{atan}(x)}{2}$$

In [16]:

```
integrate((x*sin(x)/(1+cos(x)**2)),(x,0,pi))
```

Out[16]:

$$\int_0^{\pi} \frac{x\sin(x)}{\cos^2(x)+1}\,dx$$