LECTURE 4. NUMERICAL INTEGRATION
21 October 2008, Sackville/C53

Teaching materials are at
http://personalpages.manchester.ac.uk/staff/henry.tan/teaching/computation2/computation2.htm

Concept

Integration of a function $f(x)$ in the interval $[0,1]$, $\int_0^1 f(x)dx$, can be written in a summation form as

$$\int_0^1 f(x)dx = \lim_{n\to\infty}\left[\frac{1}{n}\sum_{i=1}^{n} f\left(\frac{i}{n}\right)\right].$$

VBA code for the above summation

```
Function fint(n)
    fint = 0
    For i = 1 To n
        fint = fint + func(i / n)
    Next i
    fint = fint / n
End Function
```

Sample 1:

To get the integration

$$\int_0^1 xdx = \frac{1}{2},$$

write the Function func(x) as

```
Function func(x)
    func = x
End Function
```

The formula in the worksheet:

```
=fint(100)
```

gives 0.505;

```
=fint(200)
```

gives 0.5025.

Sample 2:

To get the integration

$$\int_0^1 \exp(x)dx = e - 1.$$

change the Function `func(x)` to

```
Function func(x)
    func = exp(x)
End Function
```

The formula in the worksheet:

```
=fint(100)
```

gives 1.726888.