Practical- 10
Trapezoidal Method
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Ques – 1

In[168]:=
```
a = Input["Enter the left end point"];
b = Input["Enter the right end point"];
n = Input["Enter the number od sub intervals to be formed"];
h = (b - a) / n;
y = Table[a + i * h, {i, 1, n}];
f[x] := Log[x];
sumodd = 0;
sumeven = 0;
For[i = 1, i < n, i += 2, sumodd += 2 * f[x] /. x → y[[i]]];
For[i = 2, i < n , i += 2,  sumodd += 2 * f[x] /. x → y[[i]]];
Tn = (h / 2) * ((f[x] /. x → a) + N[sumodd] + N[sumeven] + (f[x] /. x → b));
Print["For n =", n, ", Trapezodial estimate is: ", Tn]
in = Integrate[Log[x], {x, 4, 5.2}];
Print["True value is: ", in]
Print["Absolute error is: ", Abs[Tn - in]]
```

```
For n =5, Trapezodial estimate is: 1.24906

True value is: 1.82785

Absolute error is: 0.578785
```

Ques – 2

```
a = Input["Enter the left end point"];
b = Input["Enter the right end point"];
n = Input["Enter the number od sub intervals to be formed"];
h = (b - a) / n;
y = Table[a + i * h, {i, 1, n}];
f[x] := Sin[x];
sumodd = 0;
sumeven = 0;
For[i = 1, i < n, i += 2, sumodd += 2 * f[x] /. x → y[[i]]];
For[i = 2, i < n , i += 2,  sumodd += 2 * f[x] /. x → y[[i]]];
Tn = (h / 2) * ((f[x] /. x → a) + N[sumodd] + N[sumeven] + (f[x] /. x → b));
Print["For n =", n, ", Trapezodial estimate is: ", Tn]
in = Integrate[Sin[x], {x, 4, 5.2}];
Print["True value is: ", in]
Print["Absolute error is: ", Abs[Tn - in]] a = Input["Enter the left end point"];
b = Input["Enter the right end point"];
n = Input["Enter the number od sub intervals to be formed"];
h = (b - a) / n;
y = Table[a + i * h, {i, 1, n}];
f[x] := Sin[x];
sumodd = 0;
sumeven = 0;
For[i = 1, i < n, i += 2, sumodd += 2 * f[x] /. x → y[[i]]];
For[i = 2, i < n , i += 2,  sumodd += 2 * f[x] /. x → y[[i]]];
Tn = (h / 2) * ((f[x] /. x → a) + N[sumodd] + N[sumeven] + (f[x] /. x → b));
Print["For n =", n, ", Trapezodial estimate is: ", Tn]
in = Integrate[Sin[x], {x, 4, 5.2}];
Print["True value is: ", in]
Print["Absolute error is: ", Abs[Tn - in]]
```

```
For n =12, Trapezodial estimate is: -0.936763

True value is: -1.12216

Absolute error is: 0.185397
```