

■ Ques 1

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In[1]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := x^2;
tp = (h/2) * ((f[x] /. x -> a) + (f[x] /. x -> b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 1, 2}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]
```

Out[1]= 1

Out[2]= 2

Trap . Estimate is :2.5

Out[7]=
$$\frac{x^3}{3}$$

Out[8]= 2.33333

True Value is :2.33333

Error : 0.166667

■ Ques 2

```
In[1]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := 1/(1+x);
tp = (h/2) * ((f[x] /. x -> a) + (f[x] /. x -> b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 0, 2}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]
```

Out[1]= 0

Out[2]= 2

Trap . Estimate is :1.33333

Out[7]= $\text{Log}[1+x]$

Out[8]= 1.09861

True Value is :1.09861

Error : 0.234721

■ Ques 3

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In[11]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := Sqrt[1 + x^2];
tp = (h/2) * ((f[x] /. x -> a) + (f[x] /. x -> b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 0, 1}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]

```

Out[11]= 0

Out[12]= 1

Trap . Estimate is :1.20711

Out[17]= $\frac{1}{2} \left(x \sqrt{1+x^2} + \text{ArcSinh}[x] \right)$

Out[18]= 1.14779

True Value is :1.14779

Error : 0.0593132

■ Ques 4

```

In[21]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := 2^x;
tp = (h/2) * ((f[x] /. x -> a) + (f[x] /. x -> b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 0, 4}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]

```

Out[21]= 0

Out[22]= 4

Trap . Estimate is :34.

Out[27]= $\frac{2^x}{\text{Log}[2]}$

Out[28]= 21.6404

True Value is :21.6404

Error : 12.3596

■ Ques 5

```
In[41]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := Sin[x]/x;
tp = (h/2) * ((f[x] /. x → a) + (f[x] /. x → b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 1, 2}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]
```

Out[41]= 1

Out[42]= 2

Trap . Estimate is :0.64806

Out[47]= SinIntegral[x]

Out[48]= 0.65933

True Value is :0.65933

Error : 0.0112701

■ Ques 6

```
In[31]:= a = Input["Enter the left hand point of the interval : "]
b = Input["Enter the right hand point of the interval : "]
h = b - a;
f[x_] := Log[1 + x^2];
tp = (h/2) * ((f[x] /. x → a) + (f[x] /. x → b));
Print["Trap . Estimate is :", N[tp]]
Integrate[f[x], x]
a = N[Integrate[f[x], {x, 0, 2}]]
Print["True Value is :", N[a]]
Print["Error : ", Abs[N[a] - N[tp]]]
```

Out[31]= 0

Out[32]= 2

Trap . Estimate is :1.60944

Out[37]= $-2x + 2 \operatorname{ArcTan}[x] + x \operatorname{Log}[1 + x^2]$

Out[38]= 1.43317

True Value is :1.43317

Error : 0.176265

In[146]:=