Romberg Integration

In[ ]:=
```
ClearAll;
Romberg[a0_, b0_, n_] :=
  Module[{a = N[a0], b = N[b0], h, I},
    h = (b - a) / n;
    I = h/2 (f[a] + f[b] + 2 (Sum[f[a + h*k], {k, 1, n-1}]));
    Return[I];
  ];
```

Ques-1

In[ ]:=
```
f[x_] := 1/Sqrt[x^3 + 1];
T1 = Romberg[0, 3, 1];
T2 = Romberg[0, 3, 2];
Print["T1 = ", T1];
Print["T2 = ", T2];
T = (4 T2 - T1)/3;
Print["Answer = ", T];
```

T1 = 1.78347

T2 = 1.60887

Answer = 1.55067

Ques-2

In[ ]:=
```
f[x_] := 2^x;
T1 = Romberg[0, 4, 1];
T2 = Romberg[0, 4, 2];
Print["T1 = ", T1];
Print["T2 = ", T2];
T = (4 T2 - T1)/3;
Print["Answer = ", T];
```

T1 = 34.

T2 = 25.

Answer = 22.