

SRM Institute of Science and Technology
Department of Mathematics
21MAB206T- Numerical Methods and Analysis
UNIT –III Tutorial Sheet-2
Part-A

1. Compute $\int_0^1 \frac{1}{1+x^2} dx$ by trapezoidal rule for the following data

x	0	0.5	1
$y = \frac{1}{1+x^2}$	0	0.8	0.5

Ans: 0.775

2. Evaluate by trapezoidal rule, by dividing the range into 4 equal parts for $\int_{\frac{1}{2}}^1 \frac{1}{x} dx$

Ans: 0.697

3. Using the following data find $\int_1^7 f(x)dx$ using trapezoidal rule.

x	1	2	3	4	5	6	7
f(x)	2.105	2.808	3.614	4.604	5.857	7.451	9.467

Ans: 30.12

4. Compare trapezoidal rule and Simpson's rule in numerical integration
5. A river is 80 metres wide. The depth 'd' in metres at a distance x metres from one bank is given by the following table. Calculate the area of cross section of the river using Simpson's rule.

x :	0	10	20	30	40	50	60	70	80
d :	0	4	7	9	12	15	14	8	3

Ans: 710 sq.metres

Part-B

6. Calculate $\int_0^{\frac{\pi}{2}} \sin x dx$ using Simpson's three-eighth rule.

Ans: 0.9999

7. Evaluate $\int_4^{5.2} \log_e x dx$ using trapezoidal rule and Simpson's rule

Ans: Trap.rule=1.82765512; Simpson's one-third rule=1.82784724; Simpson's three-eighth rule=1.82784705

8. The velocity v of a particle at distance S from a point on its path is given by the table below

S (in metre)	0	10	20	30	40	50	60
v	47	58	64	65	61	52	38

Calculate the time taken to travel 60 feet by using Simpson's rule

Ans: 1.063, 1.064.

9. A rocket is launched from the ground. Its acceleration is given by the table below. Using trapezoidal and Simpson's rule find the velocity of rocket at t=80sec.

t:	0	10	20	30	40	50	60	70	80
a:	30	31.63	33.34	35.47	37.75	40.33	43.25	46.69	40.67

Ans: 3037.95, 3052.77.