

## Numerical Methods - HW4

### Q1: Composite Integration Methods

Trapezoidal Rule: 0.39614759

Simpson's Rule: 0.38566360

Midpoint Rule: 0.38080480

### Q2: Gaussian Quadrature

$n = 3$ : 0.14364821

$n = 4$ : 0.14364825

Exact: 0.14364825

### Q3: Double Integration

Simpson's Rule ( $n=4$ ,  $m=4$ ): 0.25003365

Gaussian Quadrature ( $n=3$ ,  $m=3$ ): 0.25000203

Exact Value: 0.25000000

### Q4: Improper Integrals

a)  $\int_0^1 \sin(x)/x \, dx \approx 0.61988781$

b)  $\int_1^{\infty} \sin(x)/x \, dx \approx -0.27465825$