

HW4

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Q1

```
Composite Trapezoidal Rule: 0.396148  
Composite Simpson's Rule: 0.385664  
Composite Midpoint Rule: 0.380805
```

Q2

```
Gaussian Quadrature (n=3):0.1922593773  
Gaussian Quadrature (n=4):0.1922593578  
Exact Value: 0.1922593577  
Abs Error (n=3): 1.952408e-08  
Abs Error (n=4): 7.206716e-11
```

Q3

```
Exact Value: 0.5118446  
Simpson's Rule (n = m = 4): 0.5119875  
Gaussian Quadrature (n = m = 3): 0.5118655  
Error (Simpson): 1.43e-04  
Error (Gaussian): 2.09e-05
```

Q4

```
Approximation of  $\int_0^1 x^{(-1/4)} * \sin(x) dx = 0.5259312819330654$   
Approximation of  $\int_1^\infty x^{(-4)} * \sin(x) dx = 0.2744816193780423$ 
```