

M242 Hw5 (S. Zhang)

7.7: a1-a4..

1. Compute by all methods and find the error bound each time

$$\int_0^2 4x^3 dx$$

- (a) Use the left-point rule with $h = 2$,
(b) Use the right-point rule with $h = 2$,
(c) Use the midpoint rule with $h = 2$ and $h = 1$,
(d) Use the trapezoidal rule with $h = 2$ (2 methods) and $h = 1$, (3 methods)
(e) Use the Simpson's rule with $h = 1$ (2 methods).
2. Compute by the midpoint rule with $h = 3$ and $h = 1.5$ and find the error bound each time

$$\int_1^4 8x^2 dx$$

3. Compute by the trapezoidal rule with $h = 2$ and $h = 1$ (2 methods) and find the error bound each time

$$\int_1^4 8x^2 dx$$

4. Given

$$\int_{\sin 8}^{2+\sin 8} f(x) dx, R_{h=2} = 0, L_{h=2} = 512; M_{h=2} = 32,$$

Find

$$T_{h=2}, T_{h=1}, S_{h=1}.$$

$$T_{h=2} = \frac{1}{2}R_{h=2} + \frac{1}{2}L_{h=2} = 256$$

$$T_{h=1} = \frac{1}{2}T_{h=2} + \frac{1}{2}M_{h=2} = 144$$

$$S_{h=1} = \frac{1}{3}T_{h=2} + \frac{2}{3}M_{h=2} = \frac{320}{3}$$
