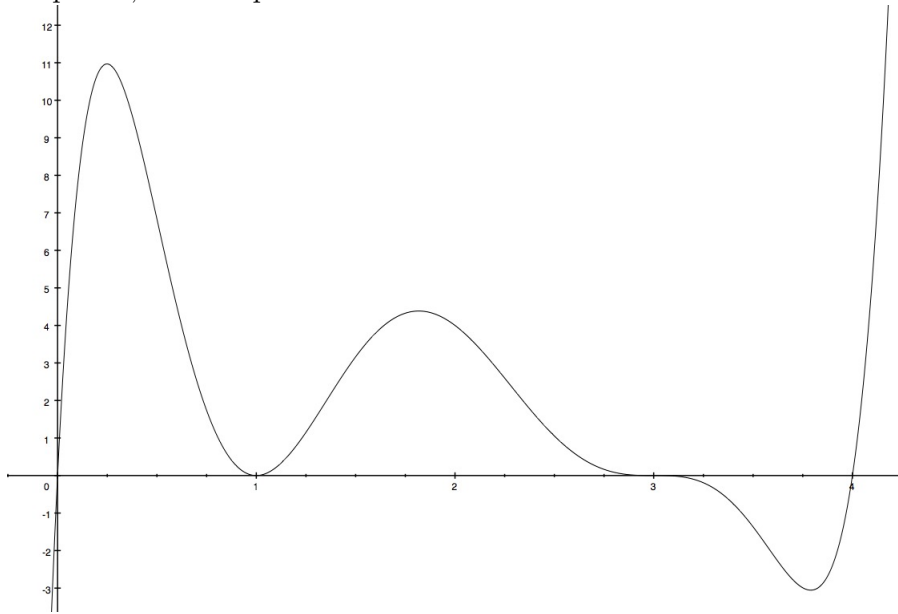


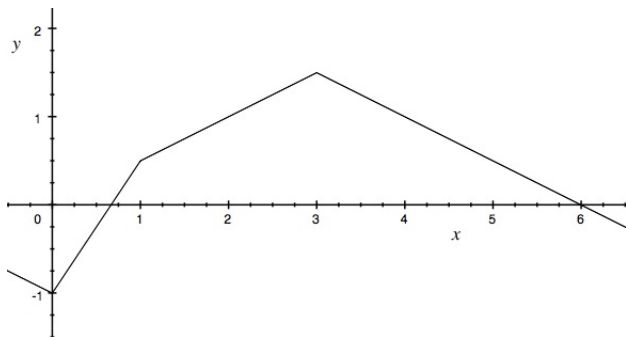
1. The graph of a function $f(x)$ is given. Estimate $\int_0^4 f(x)dx$ using 8 subintervals with right endpoints, left endpoints, and midpoints



2. Express the limit as a definite integral on the given interval: $\lim_{n \rightarrow \infty} \sum_{i=1}^n (\sqrt[3]{x_i} + 2x_i) \Delta x_i$ on $[-4, -3]$

3. Express the integral as a limit of a Riemann sum: $\int_3^9 x \ln x \, dx$

4. The graph of f is given. Evaluate the following integrals:



(a) $\int_0^3 f(x)dx$

(c) $\int_0^1 f(x)dx$

(b) $\int_1^3 f(x)dx$

(d) $\int_0^6 f(x)dx$

5. Evaluate by interpreting in terms of areas: $\int_0^4 (\sqrt{16-x^2} - 2) \, dx$

6. Given that $\int_0^1 x^3 dx = \frac{1}{4}$, evaluate $\int_0^1 (3 - 2x^3) \, dx$

7. Write as a single definite integral: $\int_3^6 f(x)dx + \int_6^8 f(x)dx + \int_4^3 f(x)dx$

8. If $\int_1^5 f(x)dx = 4$ and $\int_1^5 g(x)dx = -1$, evaluate

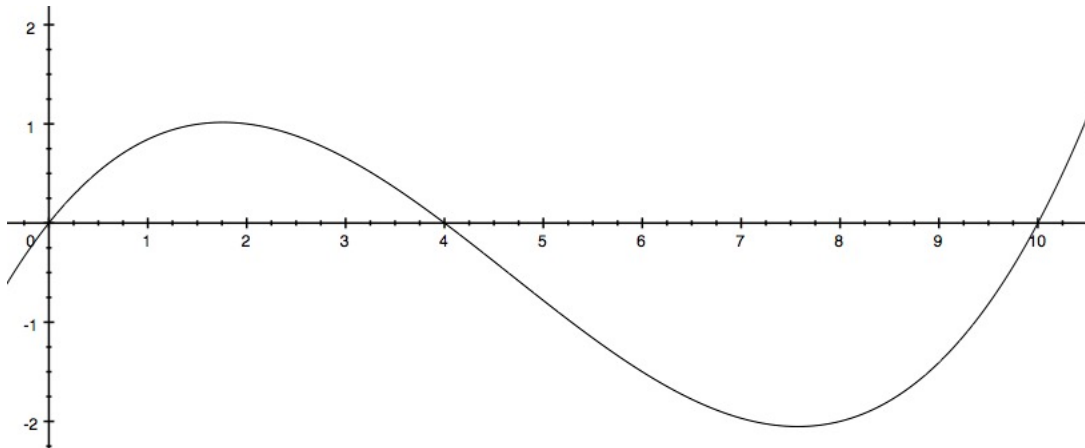
$$\int_1^5 (3f(x) + 5g(x))dx$$

9. Find $\int_0^6 f(x)dx$ if

$$f(x) = \begin{cases} 3 - x & \text{for } x < 2 \\ 1 & \text{for } x \geq 2 \end{cases}$$

10. For the function whose graph is given, list the following in increasing order:

$$\int_0^{10} f(x)dx \quad \int_0^4 f(x)dx \quad \int_4^{10} f(x)dx \quad \int_2^6 f(x)dx \quad f'(4)$$



11. Estimate the value of the integral: $\int_1^4 x^2 dx$

12. Express the limit as a definite integral: $\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{4i^3}{n^4}$