1. Compute the sum:

(a) \( \sum_{j=1}^{4} (j^2 + 1) \) 
(b) \( \sum_{k=2}^{5} (k - 2) \)

2. Express the limit as a definite integral on the given interval:

(a) \( \lim_{n \to \infty} \sum_{i=1}^{n} \pi (x_i^2 - 4) \Delta x; \quad [2, 3] \) 
(b) \( \lim_{n \to \infty} \sum_{j=1}^{n} (3x_j^2 - 2x_j + 5) \Delta x; \quad [-1, 2] \)

3. Evaluate the integral by regarding it as the area under the graph of a function:

(a) \( \int_{0}^{3} \sqrt{9-x^2} \, dx \) 
(b) \( \int_{-2}^{2} (3 + \sqrt{4-x^2}) \, dx \) 
(c) \( \int_{-1}^{4} |x - 2| \, dx \) 
(d) \( \int_{-3}^{3} 2x + 6 \, dx \)

4. Evaluate the Riemann sum for the function given on the interval \([2, 5]\) with the partition \(2, 2.6, 2.9, 3.5, 4, 5\) using the left endpoints as the sample points.

(a) \( f(x) = 3x - 2; \) 
(b) \( g(t) = t^2; \)

5. Use the Midpoint rule to approximate the integral \( \int_{2}^{5} t^2 \, dt \) with:

(a) \( n = 3 \) 
(b) \( n = 6 \)

6. Using that \( \int_{2}^{5} f(x) \, dx = 7, \int_{2}^{5} g(x) \, dx = -2, \int_{4}^{5} f(x) \, dx = 4, \) and \( \int_{-3}^{2} g(x) \, dx = 12, \) evaluate the following integrals:

(a) \( \int_{2}^{5} f(\theta) \, d\theta \) 
(b) \( \int_{2}^{5} 4f(x) - 3g(x) \, dx \) 
(c) \( \int_{2}^{4} f(t) \, dt \)

(d) \( \int_{-3}^{5} g(y) \, dy \) 
(e) \( \int_{2}^{5} f(x) - g(x) \, dx \) 
(f) \( \int_{4}^{2} f(t) \, dt \)