

1. Compute the following definite integrals:

(a)  $\int_{-1}^3 (3x^3 + x^{53} - 1) dx =$

(b)  $\int_{11}^9 2^x dx$

(c)  $\int_1^\pi 3x^3(16 - x^4)^9 dx$

(d)  $\int_2^3 \frac{x}{x^2 - e} dx$

2. Based on the definition of the definite integral, approximate

$$\int_{-1}^1 e^{(x^2)} dx$$

using  $n = 5$  rectangles.

3. Suppose that

$$\int_0^2 f(x) dx = 3$$

and that

$$f'(x) > 0$$

for all  $x$ .

- (a) Is it possible that  $\int_0^1 f(x) dx = 2$ ? Explain why or why not.  
(b) Is it possible that  $\int_0^3 f(x) dx = 2$ ? Explain why or why not.
4. (a) Sketch the curve  $y = 4 - x^2$  on the interval  $0 \leq x \leq 3$ . Find area between it and the  $x$ -axis on this interval.  
(b) Sketch the curves  $y = x^2 - 18$  and  $y = x - 6$ . Find the area of the region enclosed by them.