(1) Find the absolute maximum and minimum values for \( f(x) = (x^2 - 1)^3 \) on the interval \([-2, 2]\).

(2) Find the absolute maximum and minimum values for \( f(x) = x^2 + \frac{2}{x} \) on the interval \([\frac{1}{2}, 2]\).
(3) Find the absolute maximum and minimum values of the function \( f(x) = xe^{-x^2} \) on the interval \([-0.5, 2]\).

(4) Find the absolute maximum and minimum values of the function \( f(x) = xe^{-x^2} \) on the interval \((0, 1)\).
(5) When a management training company prices its seminar on management techniques at $400 per person, 1,000 people will attend the seminar. The company estimates that for each $5 reduction in price, an additional 20 people will attend the seminar. How much should the company charge for the seminar in order to maximize its revenue? What is the maximum revenue?
(6) Elsa and Anna need to build a rectangular corral with partitions to keep their horses, trolls, and reindeer separated as shown below. They have 720 feet of fencing material available. Find the dimensions that will maximize the total area of the corral.
(7) You need to create a box with a square base and an open top that has a volume of 4,000 $cm^3$ using as little material as possible. Find the dimensions of the box that will minimize the amount of material used.
(8) Evaluate the integral.

(a) \[ \int (8x + 17x^7) \, dx \]

(b) \[ \int (7 + x^3)(8 - x^4) \, dx \]

(c) \[ \int (7\sqrt{x^5} + 9e^x) \, dx \]
(d) \( \int \left( x^5 + 4\sqrt[4]{x^5} \right) dx \)

(e) \( \int \left( -e^x + x^{-4} - \frac{1}{3} \right) dx \)

(f) \( \int \frac{24 + x^2}{4x} \, dx \)
(9) Find $f$.

(a) $f'(x) = 5x^4 - 3x^2 + 4, \quad f(-1) = 2$

(b) $f'(x) = 1 + 3\sqrt{x}, \quad f(4) = 25$
(10) The profit from the sale of a certain product is increasing at a rate given by \( P'(x) = 360x^{1/3} \), \( P(0) = 0 \) where \( x \) represents the number of weeks since the product was made available for sale. Determine \( P(x) \).

(11) Suppose a company has a marginal cost function \( C'(x) = x\sqrt{9 + x^2} \), where \( x \) is the number of thousands of items sold and the cost \( C \) is in thousands of dollars. If the fixed costs are $10,000, find the total cost of manufacturing the first 4000 items.
(12) Evaluate the integral.

(a) \[ \int \frac{3}{(1 - 7x)^3} \, dx \]

(b) \[ \int x^6(x^7 + 1)^6 \, dx \]

(c) \[ \int \frac{x^4}{x^5 + 3} \, dx \]
(d) \[ \int 7x^5e^{x^6} \, dx \]

(e) \[ \int \frac{e^{3x}}{e^{3x} + 5} \, dx \]
(f) \( \int \frac{(\ln x)^{20}}{x} \, dx \)

(g) \( \int \frac{24e^{-6/x}}{x^2} \, dx \)
(13) A model rocket has upward velocity \( v(t) = 15t^2 \) ft/s, \( t \) seconds after launch. Use the interval \([0, 5]\) with \( n = 5 \) and equal subintervals to compute the following approximations of the distance the rocket traveled. (a) Left-hand sum, (b) Right-hand sum, and (c) Average of the two sums.
(14) If \( g(x) = \int_0^x f(t) \, dt \), where the graph of \( f(t) \) is given below, where \( 0 \leq x \leq 7 \), what is \( g(7) \)? \( g(7) = \int_0^7 f(t) \, dt \).
15) Given \( \int_1^4 f(x) \, dx = 7.5 \), \( \int_1^4 g(x) \, dx = 21 \), and \( \int_4^5 g(x) \, dx = \frac{61}{3} \), calculate the following.

(a) \( \int_1^4 (4g(x) - 9f(x)) \, dx \)

(b) \( \int_1^5 (-4g(x)) \, dx \)

16) If \( f(1) = 12 \), \( f' \) is continuous, and \( \int_1^5 f'(x) \, dx = 18 \), what is the value of \( f(5) \)?
(17) Evaluate \[ \int_1^e \left( \frac{2}{x} - \frac{3}{4} \sqrt{x} + 1 \right) \, dx. \]

(18) Evaluate \[ \int_3^A \frac{t^2 + 4t - \sqrt{t^3}}{t^3} \, dt, \text{ where } A > 3. \]
(19) Evaluate \( \int_{2}^{B} (4t^2 - 2t)(8t^3 - 6t^2)^5 \, dt \), where \( B > 2 \).