

Discussion problems assignment 5

1. What is the strategy to sketch a graph of a function $f(x)$? Can you list all the steps?
2. Is it true that if f has exactly two critical values at $x = a$ and $x = b$ with $a < b$, then there exist at least one point of inflection at $x = c$ with $a < c < b$?

Discussion problems assignment 6

1. Is it true that a function can have a point of inflection at an extreme value?
2. Determine a rational function f that has vertical asymptotes at $x = -1/2$ and $x = 1/2$, a horizontal asymptote at $y = 0$ and $h(0) = -3$.

Discussion problems assignment 8

1. What is the strategy for finding absolute maximum and minimum values?
2. Let $f(x) = (x - a)^2 + (y - b)^2$. For what value of x is y a minimum?

Discussion problems assignment 9

1. How is the second derivative useful in finding the absolute extrema of a function?
2. Find absolute maximum and minimum values of $f(x) = x\sqrt{x+3}$; $[-3, 3]$

Discussion problems assignment 10

1. What is the tangent line to the graph of $f(x) = e^{-1}$ at $x = 1$?
2. Is it true that for any exponential function $f(x) = a^x$ with $a > 1$, $f'(x)$ and $f''(x)$ are always positive?
3. Find the derivative of $f(x) = (5x^2 - 8x)e^{x^2 - 4x}$.
4. Describe the differences in the graphs of $f(x) = 3^x$ and $g(x) = x^3$.
5. Explain why $\log_a 0$ is undefined.

Discussion problems assignment 11

1. Which one is larger, 8181 or 2290 ?
2. What is the function $f(x)$ for which $f'(x) = 5f(x)$?
3. An element loses 12% of its mass every year. Find its half-life.
4. Consider the function $y = x^x$ with $x > 0$, find y' and the minimum value of y on $(0, \infty)$.

Discussion problems assignment 12

1. The rate at which a machine operator's efficiency E changes with respect to time t is given by $dE/dt = 30 - 10t$ where t is the number of hours the operator has been at work.
2. (a) Find $E(t)$ given that $E(2) = 72$;
3. (b) Use the answer to part (a) to find the operator's efficiency after 3 hr. 2. Solve for $f(t)$ where $f'(t) = \sqrt{t} + 1/\sqrt{t}$, $f(4) = 0$. 3. Approximate the area under the graph of $f(x) = \sqrt{25 - x^2}$ using 10 rectangles. 4. Use the fundamental theorem to evaluate $\int_3^0 -2e^{3x} dx$

Discussion problems assignment 13

1. Find the area of the region bounded by $y = x^4 - 3x^3 - 4x^2 + 10$, $y = 40 - x^2$, $x = 1$, $x = 3$
2. ProArt, Inc., estimates that its weekly online sales $S(t)$ for t weeks is given by $S(t) = 9e^{-t}$. Find the average weekly sales for the first 5 weeks after online sales begin.
3. Solve for K , given that $\int_2^1 (3x^2 + 5x - (3x + K)) dx = 6$. 4. Use the substitution method to evaluate $\int_1^0 12x^5 \sqrt{1 - x^2} dx$