Discussion Problems for Math 180

Thursday, November 13, 2014

1. Consider the function $f(x) = \sin(x)$

    (a) Write an expression for the n-point left Riemann sum of $f(x)$ over the interval $[0, \pi]$.

    (b) Evaluate the sum in part (a) for $n = 4$.

    (c) Evaluate the sum in part (a) for $n = 6$.

2. Consider the function $g(x) = 3x - 7$

    (a) Write an expression for the n-point left Riemann sum of $g(x)$ over the interval $[0, 12]$.

    (b) Evaluate the sum in part (a) for $n = 3$.

    (c) Evaluate this sum in part (a) for $n = 4$.

    (d) Take the limit of the sum in part (a) as $n \to \infty$.

3. Consider the function $h(x) = x^2$

    (a) Write an expression for the n-point left Riemann sum of $h(x)$ over the interval $[1, 3]$.

    (b) Evaluate the sum in part (a) for $n = 4$.

    (c) Evaluate this sum in part (a) for $n = 6$.

    (d) Take the limit of the sum in part (a) as $n \to \infty$.

4. What is $\displaystyle\int 3 \cdot 8^t \, dt$?

5. What are the dimensions of the largest rectangle which fits inside the ellipse $x^2 + 4y^2 = 100$?