

Exam 2

Name _____.

1. (14 points)

a. Given the following table, find the Left-hand sum and the Right-hand sum for $\int_1^4 f(x)dx$ using three subintervals (show your work).

x	1	2	3	4
f(x)	2	4	5	8

b. Using your calculator, find the Left-hand sum and Right-hand sum with 50 subintervals that enables you to approximate the average value of $g(x) = 3^x$ on the interval $[0, 3]$.

2. (12 points) Find an equation of the tangent line to the curve $y = f(x) = x^2$ corresponding to $x=3$.

3. (12 points) Given the following graph of $y = f(x)$ on $[0, 4]$, find the value of $\int_0^4 f(x) dx$

4. (12 points) Below is the graph of a function $f(x)$. Graph the derivative function $f'(x)$.

5. (11 points) Given the function $f(x) = x^2 + x - 3$, find $f'(x)$ algebraically (that is, use the definition of the derivative). No credit will be given for any other method.

6. (14 points) For each of the following find $f'(x)$

a. $f(x) = 3x^2 + 4e^x + 5^x$

b. $f(x) = x^3 + 2x\sqrt{x} - \frac{3}{x^2}$

7. (11 points) Graph a function $f(x)$ that satisfies all of the following conditions: $f'(x) > 0$ on $(2, \infty)$, $f'(x) < 0$ on $(-\infty, -1)$ and on $(-1, 2)$, $f'(-1) = 0 = f'(2)$, $f''(x) > 0$ on $(-\infty, -1)$ and on $(0, \infty)$, and $f''(x) < 0$ on $(-1, 0)$.

8. (14 points)

a. Use the fundamental theorem of calculus (show all work) to find the value of $\int_1^2 x^2 dx$.

b. Given the graph below of the derivative function $F'(x)$ and that $F(1) = 7$, find the maximum value of $F(x)$ on $[0, \infty)$.