Name:	
4-digit code:	

- Write your name and the last 4 digits of your SSN in the space provided above.
- The test has four (4) pages, including this one.
- You have fifty (50) minutes to complete the exam.
- Enter your answer in the box(es) provided.
- You must show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit.
- Credit for each problem is given in parentheses at the right of the problem number.
- No books, notes or calculators may be used on this test.

Page	Max. points	Your points
2	40	
3	30	
4	30	
-	100	

Problem 1 (10 pts). Find an antiderivative F(x) of the function $f(x) = x^2 - x + 1 - \frac{1}{x} + \frac{1}{\sqrt{x}}$ that satisfies F(1) = 5.



Problem 2 (10 pts each). Compute the following integrals:

(a)
$$\int \frac{dx}{\sqrt{6x}}$$



(b)
$$\int 2^x - 5e^x dx$$

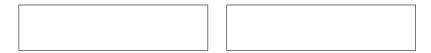


(c)
$$\int \frac{31 \ln x}{2x} \, dx$$

Problem 3 (5 pts each). Given the following sequences, find the next two elements, and the general term:

(a)
$$-\frac{1}{2}, \frac{1}{3}, -\frac{1}{4}, \frac{1}{5}, -\frac{1}{6}, \dots$$

(b) $\frac{1}{2}$, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{9}{16}$, $\frac{12}{32}$, ...



Problem 4 (10 pts each). Compute the following:

(a)
$$\sum_{k=1}^{50} (3k^2 - 7k + 1)$$

(b)
$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{2}{n} \left(\frac{2k}{n}\right)^3$$



Problem 5 (10 pts). Find the derivative of the following function

$$F(x) = \int_{\sin x}^{5+x^2 + \cos x} \sqrt{t^2 + 9} \, dt$$

Problem 6 (10 pts each). Compute the following integrals:

(a)
$$\int_0^{\pi} 2\sin x - 3\cos x \, dx$$



(b)
$$\int_0^2 (x^2+3)^2 dx$$

