Name: _____

VIP ID: _____

- Write your name and VIP ID in the space provided above.
- The test has three (3) pages, including this one.
- Credit for each problem is given in parentheses at the right of the problem number.
- No books, notes or scratch paper may be used on this test.
- An approved calculator may be used on this test.

Problem 1 (10 + 15 pts)**.** Evaluate the following integrals.

(a) $\displaystyle\int_0^4 \ln(y^2+1)\,dy =$

(b) $\displaystyle\int_{10}^{103} (9x^2+4)e^{3x}\,dx =$

Problem 2 (25 pts)**.** What is the average value of $f(x) = \sqrt{9-x^2}$ over the interval $0 \leq x \leq 3$? Round your answer to two decimal places.

Problem 3 (25 pts)**.** Find the consumer surplus for the demand curve $p = 110 - 2q$ when $q = 25$ items are sold.

Problem 4 (25 pts)**.** The marginal cost of drilling an oil well depends on the depth at which you are drilling; drilling becomes more expensive, per meter, as you dig deeper into the earth. The fixed costs are one million dollars and, if x is the depth in meters, the marginal costs are $C'(x) = 500+12x$ dollars per meter. Find the total cost of drilling a 400-meter well.