

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

(a)  $\int_{1.1}^{1.8} e^t \ln t \, dt =$

(b)  $\int_1^{108} 10xe^{x^2} \, dx =$

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**Problem 2** (25 pts). Find the average value of the function  $f(x) = 11 + 10x - x^2$  between  $x = 0$  and  $x = 3$ .

**Problem 3** (25 pts). For a product, the demand curve is  $p = 80e^{-0.008q}$  and the supply curve is  $p = 4\sqrt{q} + 10$  for  $0 \leq q \leq 500$ , where  $q$  is quantity and  $p$  is price in dollars per unit. Find the consumer surplus at the equilibrium (round your answer to the nearest dollar).

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**Problem 4** (25 pts). A forest fire covers 2002 acres at time  $t = 0$ . The fire is growing at a rate of  $8\sqrt{t}$  acres per hour, where  $t$  is in hours. How many acres are covered 24 hours later? (round your answer to the nearest integer)