MAT1505-05/08 OIS TEST 1 Print Name (Last, First) _____ /100

Show all work, including indications of mental steps, on the lined paper provided. Label and separate clearly (draw lines) each part of each problem and box each final short response requested (and nothing else). Use proper mathematical notation: "symbol" = "expression representing symbol" = ... Don't misuse equal signs, but do connect equal expressions with equal signs. Give exact answers, not decimal approximations (unless requested). Nothing on this test may be justified or supported by technology output, but you may use technology to check your work. This is a test about thinking, reasoning, and good communication of the process. You may not access the web or any existing computer files for help. Simplify all results.

① Evaluate $\int_1^9 \frac{3x}{\sqrt{10-x}}\,dx$.

② Evaluate a) $\int x e^{-\frac{x}{2}}\,dx$ b) $\int_0^4 x e^{-\frac{x}{2}}\,dx$.

③ Does $\int_1^3 \frac{2\,dx}{2x-3} = \ln 4$? Explain.

④ $V(t) = V_0 \cos(120\pi t)$ is the AC voltage delivered to your computer, where t is in seconds. a) Evaluate the average voltage over one second from $t=0$ to $t=1$, and then b) over a half cycle where $V(t)>0$, namely from $t=-\frac{1}{240}$ to $t=\frac{1}{240}$.

⑤ Use the Riemann sum limit definition to evaluate $\int_0^1 x\,dx$.
[Recall $\sum_{i=1}^{n} 1 = n$, $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$, $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$.]

⑥

t (min)	0	1	2	3	4	5	6	7	8	9	10
v (mi/h)	40	42	45	49	52	54	56	57	57	55	56

The speedometer reading (v) on a car was ~~recorded~~ observed at 1-minute intervals and recorded in this table. Use the midpoint rule to estimate the distance traveled by the car as accurately as possible. Remember consistent units.

After completing the exam, read and sign the following pledge, if it applies to you:

During this examination, all work has been my own and I have not opened any software other than MAPLE on my computer. I give my word as a decent human being that I have not resorted to any ethically questionable means of improving my performance or that of any one else on this examination, nor will I after I complete it.

Date: Feb 21, 2001 Signature: