

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. The last one may be used as scratch paper.
- The test is fifty (50) minutes long.
- 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	30	
3	30	
4	40	
Total	100	

Problem 1 (25 pts). Evaluate $\int_{-2}^2 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_{\sqrt{x^2+y^2}}^2 (x^2 + y^2) dz dy dx$. **Hint:** polar might be easier

Problem 2 (25 pts). Evaluate $\iiint_E xyz dV$, where E lies between the spheres $\rho = 2$, $\rho = 4$ and above the cone $\phi = \pi/3$.

Problem 3 (50 pts). Evaluate the given integral by making an appropriate change of variables, where R is the parallelogram enclosed by the lines $x - 2y = 0$, $x - 2y = 8$, $3x - y = 1$ and $3x - y = 9$.

$$L = \iint_R \frac{x - 2y}{3x - y} dA$$



