

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider $\int_{-1}^2 \int_0^{\sqrt{4-x^2}} (x^2 + y^2) dy dx$.

(a) Sketch the region of integration and carefully express it in polar coordinates.

(b) Use polar integration to calculate the value of the integral.

2. Calculate $\iiint_{\mathcal{W}} y dV$, where \mathcal{W} is the region above $z = x^2 + y^2$ and below $z = 5$ and bounded by $y = 0$ and $y = 1$.