1. (10 points) Set up a triple integral to find the volume of the region bounded by \( z \leq x^2 + y^2, \ x^2 + y^2 \leq 3 \) and \( z \geq 0 \) using spherical coordinates. (Recall that volume is \( \int \int R 1 \, dV \).) Do not evaluate.

2. (10 points) Switch \( \int_{0}^{2\pi} \int_{0}^{\sqrt{3}} \int_{2}^{3} z r^4 \, dz \, dr \, d\theta + \int_{0}^{2\pi} \int_{\sqrt{3}}^{2} \int_{2}^{\sqrt{4-r^2+2}} z r^4 \, dz \, dr \, d\theta \) to spherical coordinates.

3. (10 points) Find the area of the ellipse \((2x + 5y - 7)^2 + (3x - 7y + 1)^2 \leq 1\).