1. Find the maximum of \( f(x, y) = xy \) on \( x^2 + y^2 = 1 \).

2. Find the absolute extreme points of \( f(x, y) = x^2 + y^2 \) on 
\[ \{(x, y) | -1 \leq x \leq 3, -1 \leq y \leq 4\} \]

3. Find the volume of the solid which is bounded by \( z = 9 - x^2 - y^2 \) and \( z = 0 \).

4. Find the area inside \( r = 4 \sin \theta \) and outside \( r = 2 \).

5. Find the volume of the solid which is bounded by \( x = 0 \), \( y = 0 \), \( z = 0 \), and \( x + 2y + 3z = 6 \).

6. Find the volume of the solid which is bounded by \( z = \sqrt{9 - x^2 - y^2} \) and \( z = \sqrt{x^2 + y^2} \).

7. Find the volume of the intersection of \( x^2 + y^2 + (z - 6)^2 \leq 16 \) and \( x^2 + y^2 + z^2 \leq 16 \).