Math 241 §BL1
Problem Set 24

(1) Find the surface area of the portion of the hyperbolic paraboloid \( z = y^2 - x^2 \) that is above the circle \( x^2 + y^2 = 9 \) in the \( xy \)-plane.

(2) Find the surface area of the ellipsoid described by
\[
\frac{x^2}{9} + \frac{y^2}{4} + z^2 = 1.
\]

(3) Find the surface area of the part of the cone \( z^2 = a^2(x^2 + y^2) \) between the planes \( z = 1 \) and \( z = 2 \).

(4) Find the surface area of an “ice cream cone” that is the portion of the cone \( z^2 = x^2 + y^2 \) beneath the sphere \( x^2 + y^2 = 4 \) and above the plane \( z = 0 \).