A Quick Review of Multiple Integration- HW Problems

Evaluate the following Integrals.

1. $\int_0^1 \int_1^2 (3x^2 - 8xy)dxdy$

2. $\iint_D (x^2 - y^2)dA$; where D is the region in the plane bounded by $2x + y = 4$ and the positive x and y axes.

3. $\iint_D (xy)dA$; where D is the region in the plane bounded by $y = x^2 - 10$ and $y = -x^2 + 8$.

4. $\iint_D (x + y)dA$; where D is the region in the plane bounded by the triangle with vertices at $(0,0)$, $(0,1)$, and $(1,0)$.

5. Using a triple integral, find the volume of the solid bounded by $z = 4 - x^2 - y^2$ and the x-y plane.

6. Find the limits of integration in terms of x, y and z of $\iiint_W f(x,y,z)dV$ if $W = \{(x,y,z) | \sqrt{x^2 + y^2} \leq z \leq 4\}$.

7. Evaluate $\iint_D (x^2 + y^2)^{\frac{1}{2}} dxdy$; where D is

a. the disk $x^2 + y^2 \leq 9$

b. the portion of the disk $x^2 + y^2 \leq 9$ where $x \geq 0$.