Math 2000: Assignment #9. For practice only. W-06

1. Find the double integral by identifying it as a volume of a solid

a) $\int\int_R 8\ dA, \qquad R = \{(x,y)|1 \le x \le 2, -1 \le y \le 1\}$

b) $\int\int_R 8 - x\ dA, \qquad R = \{(x,y)|1 \le x \le 2, -1 \le y \le 1\}$

c) $\int\int_R 8 - y\ dA, \qquad R = \{(x,y)|1 \le x \le 2, -1 \le y \le 1\}$

d) $\int\int_R \sqrt{4 - x^2 - y^2}\ dA, \qquad R = \{(x,y)|x^2 + y^2 \le 4\}$

2. Calculate the iterated integral

a) $\int_1^2 \int_0^4 1 + xy\, dxdy$ b) $\int_1^2 \int_0^4 1 + xy\, dydx$

c) $\int_1^2 \int_0^{\pi/2} x \sin y\, dydx$ d) $\int_0^{\ln 2} \int_0^{\ln 3} e^{2x-y}\, dxdy$

e) $\int_1^2 \int_2^4 \frac{x}{y} - \frac{y}{x}\, dxdy$ f) $\int_0^1 \int_0^1 \frac{xy}{\sqrt{x^2 + y^2 + 10}}\, dydx$

g) $\int_0^1 \int_0^1 \frac{1 + x^2}{1 + y^2}\, dxdy$ h) $\int_0^{\pi} \int_0^{\pi/2} \cos(x + 2y)\, dydx$

3. Calculate the double integral over general region. Sketch the region.

a) $\int\int_D x^2 y\, dA, \qquad D = \{(x,y)|1 \le x \le 2, -x \le y \le x\}$

b) $\int\int_D \sqrt{x}\, dA \qquad D = \{(x,y)|y \le x \le e^y, 0 \le y \le 1\}$

c) $\int\int_D x + y\, dA, \qquad D$ is bounded by $y = \sqrt{x}$ and $y = x^2$

d) $\int\int_D xy\, dA, \qquad D$ is the triangular region with vertices $(0,2)$, $(4,0)$, $(0,0)$.

e) $\int\int_D x\sqrt{y^2 - x^2}\, dA \qquad D = \{(x,y)|0 \le x \le y, 0 \le y \le 1\}$

f) $\int_0^1 \int_0^v \sqrt{1 - v^2}\, dudv.$