

## Triple Integral (Exercise).

1- Evaluate  $I = \iiint_S 3(x^2y + y^2z) dv$

where  $S$  is bounded by the planes  $x=1$ ,  $x=3$ ,  $y=-1$ ,  $y=1$ ,  $z=2$  and  $z=4$ .

2- Evaluate in six different ways

$I = \iiint_S (x + 2y + 4z) dx dy dz$ , where

$S$  is defined by  $1 \leq x \leq 2$ ,  $-1 \leq y \leq 0$ ,  $0 \leq z \leq 3$ .

3 
$$\int_0^4 \int_0^{4-x} \int_0^{4-x-y} dz dy dx = ?$$

4 
$$\int_0^2 \int_0^1 \int_0^1 xyz \sqrt{2-y^2} y^2 dx dy dz = ?$$

5 
$$\int_0^2 \int_0^{\sqrt{4-z^2}} \int_0^{4-y^2-z^2} dx dy dz = ?$$

6 
$$\iiint_S z dx dy dz$$
,  $S$  bounded by  $\sqrt{x^2+y^2}=2$ ,  $z=0$   
 $x=\pm 1$ ,  $y=\pm 1$

7 
$$\iiint_S x^2 y^2 z dx dy dz$$
,  $S$  defined by  $0 \leq z \leq x^2 - y^2$   
 $0 \leq x \leq 1$ ,  $0 \leq y \leq 1$