

THANKSGIVING SOLUTIONS

26 NOV 08

$$\boxed{1} \int_{-3}^3 dx \int_{-\sqrt{9-x^2}}^{\sqrt{9-x^2}} dy \int_1^{5-x} dz = 36\pi$$

$$\boxed{2} \int_{-\frac{1}{\sqrt{2}}}^{\frac{1}{\sqrt{2}}} dx \int_{-\sqrt{1-2x^2}}^{\sqrt{1-2x^2}} dy \int_{5x^2+5y^2}^{6-7x^2-y^2} dz = \frac{3\pi}{\sqrt{2}}$$

$$\boxed{3} \int_{-2}^2 dx \int_0^{4-x^2} dy \int_{-\sqrt{4-x^2-y}}^{\sqrt{4-x^2-y}} dz = 8\pi$$

$$\int_{-2}^2 dx \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} dz \int_0^{4-x^2-z^2} dy = 8\pi$$

$$= \int_0^{2\pi} d\theta \int_0^2 r(4-x^2-z^2) dr \quad x^2+z^2=r^2$$

$$= \int_0^{2\pi} d\theta \int_0^2 r(4-r^2) dr = 8\pi$$