### $\mathbb{MA}$ **1521**
### **Tutorial 9**

1. Find the volume of the solid whose base is the region in the $xy$-plane that is bounded by the parabola $y = 4 - x^2$ and the line $y = 3x$, while the top of the solid is bounded by the plane $x - z + 4 = 0$.

    **Ans**: $625/12$

2. Find the area of the surface consisting of the part of the sphere $x^2 + y^2 + z^2 = 2^2$ that lies above the horizontal plane $z = 1$.

    **Ans**: $4\pi$

3. Find the exact value of the surface area of the portion of the upper cone

$$z = \sqrt{x^2 + y^2}$$

   above the region $D = \left\{ (x, y) \in R^2 : \quad x^2 \le y \le x + 2, \quad -1 \le x \le 2. \right\}$.

   **Ans**: $\frac{9\sqrt{2}}{2}$.

4. Find the area cut from the saddle surface $az = x^2 - y^2$ by the cylinder $x^2 + y^2 = a^2$. Here $a$ is a positive constant.

    **Ans**: $\frac{\pi a^2}{6} \left( 5^{\frac{3}{2}} - 1 \right)$