

Math 2263
Check-up 5
chapter 16 and review

1. Let S be the part of the elliptic paraboloid $y = 8 - 2x^2 - 8z^2$ that lies to the right of the xz -plane, with outward pointing normal, and let C be the boundary curve of S that lies in the xz -plane, with compatible orientation. Let $\mathbf{F} = \langle 3xy, x^2, 4yz \rangle$. Find

$$\int_C \mathbf{F} \cdot d\mathbf{r}.$$

2. Let C be the closed curve in the xy -plane that travels from $(-3, -27)$ to the origin along the graph of $y = 6x - x^2$, and then travels from the origin back to $(-3, -27)$ along the graph of $y = x^3$. Let $\mathbf{F} = \langle x^4 - 3y, 2x + y^5 \rangle$. Find

$$\int_C \mathbf{F} \cdot d\mathbf{r}.$$

3. Let S be the surface of the part of the solid ball of radius 5 about the origin that lies in the first octant. Let $\mathbf{F} = \langle z^3 + xy^4, 2y - x^3, 4z - zy^4 \rangle$. Find

$$\iint_S \mathbf{F} \cdot d\mathbf{S}.$$