

Final Exam Review

Questions/Topics?

Example 162. Evaluate the integral $\int_C y^2 dx + x^2 dy$ where C is the circle $x^2 + y^2 = 4$.

Example 163. Find the outward flux of $\mathbf{F} = 2xy\mathbf{i} + 2yz\mathbf{j} + 2xz\mathbf{k}$ across the boundary of the cube cut from the first octant by the planes $x = 1, y = 1, z = 1$.

Example 164. Find the work done by $\mathbf{F} = \frac{x\mathbf{i} + y\mathbf{j}}{(x^2 + y^2)^{3/2}}$ on an object moving along the plane curve $\mathbf{r}(t) = \langle e^t \cos(t), e^t \sin(t) \rangle$ from the point $(1, 0)$ to the point $(e^{2\pi}, 0)$.

Example 165. Find the flux of the field $\mathbf{F} = \langle 2xy + x, xy - y \rangle$ outward across the boundary of the square bounded by $x = 0, x = 1, y = 0, y = 1$.

Example 166. Find the flux of $\mathbf{F} = xz\mathbf{i} + yz\mathbf{j} + \mathbf{k}$ across the upper cap cut from the sphere $x^2 + y^2 + z^2 = 25$ by the plane $z = 3$, oriented away from the xy -plane.