

Name _____

Homework 7

Sections 16.5 & 18.1–18.2

1. (5) Determine the integral of $f(x, y, z) = \frac{3x^2}{2x^2 + 2y^2}$ over the solid, Q , which is bounded between the graph of $z = 5 - \frac{1}{2}\sqrt{x^2 + y^2}$ and the $z = 1$ plane.

2. (5) Evaluate $\int_{-2}^0 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_0^{\sqrt{4-x^2-y^2}} \frac{2x}{\sqrt{x^2+y^2+z^2}} dz dy dx$

3. (5) Let C be the line segment from $(1, 4, 9)$ to $(5, 6, 7)$ and consider the vector field $\vec{F}(x, y, z) = (x + y)\vec{i} + (xz)\vec{j} + (y - 4)^2\vec{k}$. Compute $\int_C \vec{F} \cdot d\vec{r}$.

4. (5) Evaluate $\int_C y^2 dx - xz dy + z dz$ where the curve C is the path from $(1, 4, 3)$ to $(4, 7, 12)$ given by the parametric equations $x = t^2$, $y = 1 + 3t$, $z = t^3 + 2t$.

5. (5) Compute (using a parameterized curve) $\int_C \left[(5y^2 + 7)\vec{i} - (3y + x)\vec{j} \right] \cdot d\vec{r}$ where C is the oriented curve shown below.

