

Name

Math 230

Quiz 12 Due 28th by 1:00pm

**0.(0 points)** Make sure you are familiar with the definitions and theorems in section 17.5. Do exercise 12 on page 1132.

**1.(3 points)** Find the area of the part of *helicoid* with vector equation  $\vec{r}(u, v) = u \cos v \vec{i} + u \sin v + v \vec{k}$  where  $0 \leq u \leq 1, 0 \leq v \leq \pi$  (Do not evaluate the integral).

**2.(3 points)** Find the flux of  $\vec{F} = xz \vec{i} - z \vec{j} + y \vec{k}$  across the hemisphere  $x^2 + y^2 + z^2 = 25, y \geq 0$ , oriented in the direction of the positive  $y$ -axis. (Do not evaluate the integral).

**3.(4 points)** Use Stokes' Theorem to evaluate  $\iint_S \text{curl } \vec{F} \cdot d\vec{S}$  where  $\vec{F} = x^2y^3z \vec{i} + \sin(xyz) \vec{j} + xyz \vec{k}$ , where  $S$  is the part of the cone  $y^2 = x^2 + z^2$  that lies between the planes  $y = 0$  and  $y = 2$ , oriented in the direction of the positive  $y$ -axis. (Do not evaluate the integral).

**4.(0 points)** Do some exercises on the Divergence theorem.