Review 1: Many Equations

Monday, May 2

- $\langle x, y, z\rangle = \langle \rho \sin\phi \cos\theta, \rho \sin\phi \sin\theta, \rho \cos\phi\rangle$
- $Df_u = \nabla f \cdot u$
- $V = |\mathbf{a} \cdot (\mathbf{b} \times \mathbf{c})|$
- $z^2 = ax^2 + by^2 + k$
- $dV = \rho^2 \sin\phi \, d\rho \, d\phi \, d\theta$
- $dA = r \, dr \, d\theta$
- $\int \mathbf{F} |\mathbf{r}'(t)| \, dt$
- $z = ax + by^2$
- $\nabla f = \lambda \nabla g$
- $z^2 = ax^2 + by^2 - k$
- $z = ax^2 + by^2$
- $\iint_D \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dA$
- $A = \oint_C x \, dy$
- $A = \iint_D |\mathbf{r}_u \times \mathbf{r}_v| \, dA$
- $A = |\mathbf{a} \times \mathbf{b}|$
- $\mathbf{n} \cdot x = k$
- $z = ax^2 - by^2$
- $\mathbf{N}(t) = \mathbf{T}'(t)/|\mathbf{T}'(t)|$
- $\Pi_{\mathbf{a}}(\mathbf{b}) = \frac{\mathbf{a} \cdot \mathbf{b}}{|\mathbf{a}|^2} \mathbf{a}$
- $ax^2 + by^2 + cz^2 = k$
- $f_{xx} f_{yy} - f_{xy}^2 < 0$
- $\mathbf{n} \cdot (\mathbf{r} - \mathbf{r}_0) = 0$
- $\mathbf{r}(t) = \langle x(t), y(t), z(t)\rangle$
- $dS = \sin\phi \, d\phi \, d\theta$
- $\langle x, y\rangle = \langle r\cos\theta, r \sin\theta\rangle$
- $\mathbf{T}(t) = \mathbf{r}'(t)/|\mathbf{r}'(t)|$
- $ds^2 = dx^2 + dy^2$
- $\int_C f \, ds$
- $\{(x, y, z) : z = \sqrt{x^2 + y^2}\} = \{(\rho, \theta, \phi) : \phi = \pi/4\}$
- $\iint_S f(x, y) \left| \frac{\partial(x, y)}{\partial(u, v)} \right| du \, dv$
- $\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x}$
- $f(x) \approx f(x_0) + \nabla f(x_0) \cdot (x - x_0)$
- $\mathbf{a} \cdot \mathbf{b} = |\mathbf{a}||\mathbf{b}| \cos\theta$
- $\mathbf{r} = \mathbf{r}_0 + t\mathbf{v}$
- $f_{xx} f_{yy} - f_{xy}^2 = 0$
- $\mathbf{r}(t) = t\mathbf{r}_0 + (1 - t)\mathbf{r}_1$
- $A = \iint_D \sqrt{f_x^2 + f_y^2 + 1} \, dA$
- $\iint \mathbf{F} \cdot d\mathbf{S} = \iint_D \left(-P \frac{\partial g}{\partial x} - Q \frac{\partial g}{\partial y} + R \right) dA$
- $z^2 = ax^2 + by^2$
- $f_{xx} f_{yy} - f_{xy}^2 > 0$
- $\kappa = |d\mathbf{T}/ds|$
- $-\nabla f$
- $\int_C \mathbf{F} \cdot d\mathbf{r} = f(\mathbf{r}(b)) - f(\mathbf{r}(a))$
- $\mathbf{a} = v'\mathbf{T} + \kappa v^2 \mathbf{N}$
- $\nabla \cdot f = 0$
- $\int_C \mathbf{F} \cdot d\mathbf{r} = \iint_S (\nabla \times \mathbf{F}) \cdot d\mathbf{S}$