

MATH 3202 (Vector Calculus) Formula Sheet

Note: Not all formulas will necessarily be of use on this final exam.

- Components of Acceleration

- $a_T = \frac{\mathbf{r}'(t) \cdot \mathbf{r}''(t)}{\|\mathbf{r}'(t)\|}$

- $a_N = \frac{\|\mathbf{r}'(t) \times \mathbf{r}''(t)\|}{\|\mathbf{r}'(t)\|}$

- Polar Coordinates

- $x = r \cos(\theta), \quad y = r \sin(\theta)$

- $dA = r \, dr \, d\theta$

- Cylindrical Coordinates

- $x = r \cos(\theta), \quad y = r \sin(\theta), \quad z = z$

- $dV = r \, dr \, d\theta \, dz$

- Spherical Coordinates

- $x = \rho \sin(\phi) \cos(\theta), \quad y = \rho \sin(\phi) \sin(\theta), \quad z = \rho \cos(\phi)$

- $dV = \rho^2 \sin(\phi) \, d\rho \, d\phi \, d\theta$