**Exam #1 Reference Sheet**

$$\frac{\mathbf{a} \cdot \mathbf{b}}{||\mathbf{a}|| \, ||\mathbf{b}||}$$

$$\frac{\mathbf{a} \cdot \mathbf{b}}{||\mathbf{a}||}, \quad \frac{\mathbf{a} \cdot \mathbf{b}}{||\mathbf{a}||^2}\mathbf{a}$$

$$\frac{\mathbf{r}'(t)}{||\mathbf{r}'(t)||}$$

$$\int_a^b ||\mathbf{r}'(t)|| \, dt$$

$$\int_a^t ||\mathbf{r}'(u)|| \, du$$

$$\left|\left|\frac{d\mathbf{T}}{ds}\right|\right|, \quad \frac{||\mathbf{T}'(t)||}{||\mathbf{r}'(t)||}, \quad \frac{||\mathbf{r}'(t) \times \mathbf{r}''(t)||}{||\mathbf{r}'(t)||^3}$$

$$\frac{\mathbf{r}'(t) \cdot \mathbf{r}''(t)}{||\mathbf{r}'(t)||}, \quad \frac{||\mathbf{r}'(t) \times \mathbf{r}''(t)||}{||\mathbf{r}'(t)||}$$