Subscripts in math mode are written as a_b and superscripts are written as a^b. These can be combined and nested to write expressions such as

$$T^{i_1 i_2 \dots i_p}_{j_1 j_2 \dots j_q} = T(x^{i_1}, \dots, x^{i_p}, e_{j_1}, \dots, e_{j_q})$$

We write integrals using $\int$ and fractions using $\frac{a}{b}$. Limits are placed on integrals using superscripts and subscripts:

$$\int_0^1 \int_0^2 \frac{dx}{e^x} = \frac{e-1}{e}$$

Lower case Greek letters are written as ω δ etc. while upper case Greek letters are written as Ω Δ.

$$\mathbf{p} = \int R\hat{\mathbf{r}} \frac{q}{2\pi R} \cos(2\phi) R d\phi = \frac{Rq}{2\pi} \hat{\mathbf{r}} \int_0^{2\pi} \cos(2\phi) d\phi = 0 \tag{1}$$

Mathematical operators are prefixed with a backslash as $\sin(\beta)$, $\cos(\alpha)$, $\log(x)$ etc.

amsmath

$$\frac{\mu_o M_s}{4\pi}$$

$$\mathbf{g}(r,\phi,z,r',\phi',z') = \sqrt{\frac{1}{r^2 + r'^2 - 2rr'\cos(\phi-\phi') + (z-z')^2)}}$$

$$\mathbf{B_r} = \frac{\mu_o M_s r'}{4\pi}\int_{z_1}^{z_2}\int_0^{2\pi}\cos(\phi')\,[r - r'\cos(\phi-\phi')] \times g^3(r,\phi,z,r',\phi',z')\,d\phi'\,dz'$$

$$\mathbf{B}_\phi = \frac{\mu_o M_s r'^2}{4\pi}\int_{z_1}^{z_2}\int_0^{2\pi}\cos(\phi') \times [\sin(\phi-\phi')]\,g^3(r,\phi,z,r',\phi',z')\,d\phi'\,dz'$$

$$\mathbf{B_z} = \frac{\mu_o M_s r'}{4\pi}\int_{z_1}^{z_2}\int_0^{2\pi}\cos(\phi')\,[z-z'] \times g^3(r,\phi,z,r',\phi',z')\,d\phi'\,dz'$$

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$$\mathbf{F}(x,y,z,x_m,y_1,y_2,z_k) = \frac{(y-y_1)+\sqrt{[(x-x_m)^2+(y-y_1)^2+(z-z_k)^2]}}{(y-y_2)+\sqrt{[(x-x_m)^2+(y-y_2)^2+(z-z_k)^2]}}$$

$$\mathbf{B_x} = \frac{\mu_o M_s}{4\pi}\sum_{k=1}^{2}\sum_{m=1}^{2}(-1)^(k+m)ln[F(x,y,z,x_m,y_1,y_2,z_k)]$$

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$$\mathbf{H}(x,y,z,x_1,x_2,y_m,z_k) = \frac{(x-x_1)+\sqrt{[(x-x_1)^2+(y-y_m)^2+(z-z_k)^2]}}{(x-x_2)+\sqrt{[(x-x_2)^2+(y-y_m)^2+(z-z_k)^2]}}$$

$$\mathbf{B_y} = \frac{\mu_o M_s}{4\pi}\sum_{k=1}^{2}\sum_{m=1}^{2}(-1)^(k+m)ln[H(x,y,z,x_1,x_2,y_m,z_k)]$$

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$$\mathbf{G}(x,y,z,x_n,y_m,z_k) = \frac{1}{\sqrt{[(x-x_n)^2+(y-y_m)^2+(z-z_k)^2]}}$$

$$\mathbf{B_z} = \frac{\mu_o M_s}{4\pi}\sum_{k=1}^{2}\sum_{n=1}^{2}\sum_{m=1}^{2}(-1)^(k+n+m)\times\arctan[\frac{(x-x_n)(y-y_m)}{(z-z_k)}g(x,y,z,x_n,y_m,z_k)]$$