

$$\begin{array}{l} x \\ f(x) \\ (x,y) \\ F(x,y) \\ (x,y,z) \\ \vec{F} \\ \mathbf{R}_{vectors,radial,figures}/\mathbf{fig}_{vectors,radial} \\ \mathbf{R}_{vectors,radial,over_r,figures}/\mathbf{fig}_{vectors,radial,over_r} \\ \mathbf{R}_{vectors,radial,over_{rsquared},figures}/\mathbf{fig}_{vectors,radial,over_{rsquared}} \\ \vec{R} \\ xy \\ \text{vec-} \\ \text{tor} \\ \text{field} \\ \vec{F} \\ (x,y) \\ \vec{R} \\ F(x,y) \\ \vec{F}(x,y)=M(x,y)\vec{i}+N(x,y)\vec{j}. \end{array}$$

$$\begin{array}{l} M \\ N \\ M(x,y,z) \\ N(x,y,z) \\ P(x,y,z) \\ \vec{F}(x,y,z)=M(z,y,z)\vec{i}+N(x,y,z)\vec{j}+P(x,y,z)\vec{k}. \end{array}$$

$$\begin{array}{l} (x,y) \\ \vec{R}_x= \\ xi+ \\ yj \\ M(x,y)= \\ x \\ N(x,y)= \\ y \\ ?? \\ | \\ R|= \\ \sqrt{x^2+y^2}= \end{array}$$

$$\begin{array}{l} \vec{F} \\ \vec{F}= \\ \vec{R}r \\ F(x,y)=x\sqrt{x^2+y^2}\vec{i}+y\sqrt{x^2+y^2}\vec{j} \end{array}$$

$$\begin{array}{l} \vec{R}_x= \\ xi+ \\ yj \\ ?? \\ ?? \\ \vec{R}r^2 \\ 1/r \end{array}$$

$$\vec{S}(x,y)=-y\vec{i}+x\vec{j}$$

$$\begin{array}{l} \mathbf{S}_{vectors,spin,figures}/\mathbf{fig}_{vectors,spin} \\ \mathbf{S}/r_{vectors,spin,over_r,figures}/\mathbf{fig}_{vectors,spin,over_r} \\ \mathbf{S}/r^2_{vectors,spin,over_{rsquared},figures}/\mathbf{fig}_{vectors,spin,over_{rsquared}} \\ ?? \\ \vec{M}(x,y)= \\ -y \\ N(x,y)= \\ x \\ \vec{S}(x,y) \\ |\vec{S}|=\sqrt{(-y)^2+x^2}=r \end{array}$$

$$\begin{array}{l} \vec{S} \\ \vec{R} \\ \vec{S} \\ \vec{R}= \\ (-y)(x)+ \\ (x)(y)= \\ 0 \\ \vec{S}/r \\ \vec{S}/r^2 \\ 1 \\ 1/r \\ ?? \\ ?? \\ (0,0) \end{array}$$

$$\begin{array}{l} \text{Gradient} \\ \text{Vec-} \\ \text{tor} \\ \text{Fields} \end{array}$$