10.18.

$$\mathbf{u} = f(x) \ (x^2 + y^2 + z^2)$$

$$\mathbf{u} = f(x)(2x, 2y, 2z)$$

$$div\,\mathbf{u} = 2\ \frac{\partial}{\partial x}\{f(x)x\} + \frac{\partial}{\partial y}\{f(x)y\} + \frac{\partial}{\partial z}\{f(x)z\}$$

$$div\,\mathbf{u} = 2\{f(x)x + f(x) + f(x) + f(x)\}$$

Källfritt : $div\,\mathbf{u} = 0.$

$$f\ '(x)x + 3f(x) = 0$$

$$f\ '(x)x^3 + 3x^2 f(x) = 0$$

$$\frac{d}{dx}\left\{x^3 f(x)\right\} = 0$$

$$x^3 f(x) = C$$

SVAR: Källfritt vektorfält då $f(x) = \dfrac{C}{x^3}$.