1 Curl Practice including Curvilinear Coordinates

Calculate the curl of each of the following vector fields. You may look up the formulas for curl in curvilinear coordinates.

(a)

$$\vec{F} = z^2\,\hat{x} + x^2\,\hat{y} - y^2\,\hat{z} \tag{1}$$

(b)

$$\vec{G} = e^{-x}\,\hat{x} + e^{-y}\,\hat{y} + e^{-z}\,\hat{z} \tag{2}$$

(c)

$$\vec{H} = yz\,\hat{x} + zx\,\hat{y} + xy\,\hat{z} \tag{3}$$

(d)

$$\vec{I} = x^2\,\hat{x} + z^2\,\hat{y} + y^2\,\hat{z} \tag{4}$$

(e)

$$\vec{J} = xy\,\hat{x} + xz\,\hat{y} + yz\,\hat{z} \tag{5}$$

(f)

$$\vec{K} = s^2\,\hat{s} \tag{6}$$

(g)

$$\vec{L} = r^3\,\hat{\phi} \tag{7}$$