

1 Divergence Practice including Curvilinear Coordinates

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

(a)
$$\hat{F} = z^2 \hat{x} + x^2 \hat{y} - y^2 \hat{z} \tag{1}$$

(b)
$$\hat{G} = e^{-x} \hat{x} + e^{-y} \hat{y} + e^{-z} \hat{z} \tag{2}$$

(c)
$$\hat{H} = yz \hat{x} + zx \hat{y} + xy \hat{z} \tag{3}$$

(d)
$$\hat{I} = x^2 \hat{x} + z^2 \hat{y} + y^2 \hat{z} \tag{4}$$

(e)
$$\hat{J} = xy \hat{x} + xz \hat{y} + yz \hat{z} \tag{5}$$

(f)
$$\hat{K} = s^2 \hat{s} \tag{6}$$

(g)
$$\hat{L} = r^3 \hat{\phi} \tag{7}$$