

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

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

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

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

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

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

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