

### I.Ödev Cevap Anahtarı

1.  $V = x^2U_1 + xyU_2 - \frac{x}{z}U_3$ ,  $v_p = (-1, 0, 1)_p$ ,  $p = (1, 2, -3)$ ,  $f(x, y, z) = xy^2z^2$

a)  $v_p[f] = \sum v_i \frac{\partial f}{\partial x_i}(p) = -y^2z^2|_p + 0 + 2xy^2z|_p = -36 - 24 = -60$

b)  $V[f] = x^2U_1[f] + xyU_2[f] - \frac{x}{z}U_3[f] = x^2y^2z^2 + 2x^2y^2z^2 - 2x^2y^2$   
 $= x^2y^2(3z^2 - 2)$

c)  $V(p) = (1, 2, \frac{2}{3})_p$

2.

a)  $V = \frac{2}{7}z^2U_1 - \frac{1}{7}xyU_3$

b)  $V(p) = (p_1, p_3 - p_2, 0) \Rightarrow V = xU_1 + (z - y)U_2$

c)  $V(p) = (-p_1, -p_2, -p_3) \Rightarrow V = -xU_1 - yU_2 - zU_3$

3.  $\alpha(t) = (2\cos^2t, \sin 2t, 2\sin t)$ ,  $h(s) = \sin^{-1}s$

$$\begin{aligned}\beta(s) &= \alpha(h(s)) = \alpha(\arcsins) \\ &= (2\cos^2(\arcsins), \sin(2\arcsins), 2\sin(\arcsins)) \\ &= (2(1 - s^2), 2s\sqrt{1 - s^2}, 2s)\end{aligned}$$