

$$16. \nabla f = \langle y^2 z^3, 2xyz^3, 3x^2 z^2 \rangle$$

$$\nabla g = \langle 1, 2y, 3z^2 \rangle$$

$$\begin{aligned} \nabla f \cdot \nabla g &= y^2 z^3 + 4xyz^3 + 9x^2 z^4 \\ &= 1 + 4 + 9 \\ &= 14 \end{aligned}$$

$$17. \lim_{(x,y,z,w) \rightarrow (0,0,0,0)} \frac{(x+y)^2 - (z+w)^2}{x+y-z-w} = \frac{((x+y) + (z+w)) \cancel{(x+y) - (z+w)}}{\cancel{(x+y) - (z+w)}} = (x+y) + (z+w) = 0$$