3.4

$V = xy - z^2$

$\vec{A} = (\hat{x} - \hat{y}z)$

$\nabla V = y\hat{x} + x\hat{y} - 2z\hat{z}$

$\frac{dV}{dl} = \nabla V.\hat{a} = ?$

$\nabla V = \hat{x}y + \hat{y}x - 2z\hat{z}$

$\hat{a} = \frac{\hat{x} - \hat{y}z}{\sqrt{1+z^2}}$

$\frac{dV}{dl} = \nabla V.\hat{a} = \frac{y - xz}{\sqrt{1+z^2}}$

at $P(1,-1,2)$

$\frac{dV}{dl} = \frac{(-1)-(1)(2)}{\sqrt{1+2^2}} = \frac{-3}{\sqrt{5}}$