

Problem 3.32 Find the gradient of the following scalar functions:

(d) $W = e^{-R} \sin \theta$.

Solution:

(d) From Eq. (3.83),

$$\nabla W = -\hat{\mathbf{R}}e^{-R} \sin \theta + \hat{\boldsymbol{\theta}}(e^{-R}/R) \cos \theta.$$