Suppose

$$z = x^2 \sin y, \quad x = -s^2 + 2t^2, \quad y = 10st.$$

A. Use the chain rule to find $\dfrac{\partial z}{\partial s}$ and $\dfrac{\partial z}{\partial t}$ as functions of x, y, s and t.

$\dfrac{\partial z}{\partial s} =$ [ ]

$\dfrac{\partial z}{\partial t} =$ [ ]

B. Find the numerical values of $\dfrac{\partial z}{\partial s}$ and $\dfrac{\partial z}{\partial t}$ when $(s, t) = (5, -3)$.

$\dfrac{\partial z}{\partial s}(5, -3) =$ [ ]

$\dfrac{\partial z}{\partial t}(5, -3) =$ [ ]

Suppose

$$z = x^2 \sin y, \quad x = -s^2 + 2t^2, \quad y = 10st.$$

A. Use the chain rule to find $\dfrac{\partial z}{\partial s}$ and $\dfrac{\partial z}{\partial t}$ as functions of x, y, s and t.

$\dfrac{\partial z}{\partial s} =$ $-4sx \sin y + 10tx^2 \cos y$

$\dfrac{\partial z}{\partial t} =$ $8tx \sin y + 10sx^2 \cos y$

B. Find the numerical values of $\dfrac{\partial z}{\partial s}$ and $\dfrac{\partial z}{\partial t}$ when $(s, t) = (5, -3)$.

$\dfrac{\partial z}{\partial s}(5, -3) =$ $-140 \sin(150) - 1470 \cos(150)$

$\dfrac{\partial z}{\partial t}(5, -3) =$ $-168 \sin(150) + 2450 \cos(150)$