Problem Definition

Problem 29. Find the first partial derivatives of the function

$$w = 3x^2y - 5xyz + 10yz^2$$

Solution Step 1:

There are three partial derivatives to compute. These are the following.

$$\frac{\partial w}{\partial x} = w_x = 3(2x)y - 5(1)yz + 0 = 6xy - 5yz,$$

$$\frac{\partial w}{\partial y} = w_y = 3x^2(1) - 5x(1)z + 10(1)z^2 = 3x^2 - 5xz + 10z^2$$

and

$$\frac{\partial w}{\partial z} = w_z = 0 - 5xy(1) + 10y(2z) = -5xy + 20yz$$