Quiz 7 Solution

Problem 1

$$4x^3 \frac{\partial x}{\partial z} \cdot z + x^4 + y \cdot \frac{1}{x} \cdot \frac{\partial x}{\partial z} - 4x^3 \frac{\partial x}{\partial z} = 0$$

Let $x=1$, $y=-1$, $z=-3$, Then

$$-12 \frac{\partial x}{\partial z} + 1 + (-1) \frac{\partial x}{\partial z} - 4 \frac{\partial x}{\partial z} = 0$$

$$\Rightarrow \frac{\partial x}{\partial z} = \frac{1}{17}$$

Problem 2

$$w = xy + \ln z = \frac{v^2}{u}(u+v) + \ln \sinh u = v^2 + \frac{v^3}{u} + \ln \sinh u$$

$$\frac{\partial w}{\partial v} = 2v + \frac{3v^2}{u}$$

Let $u=-1$, $v=2$, Then

$$\frac{\partial w}{\partial v} = 4 + \frac{12}{-1} = -8$$