# Problem 2

(5 points): Find $\partial w/\partial v$ when $u = -1$, $v = 2$ if $w = xy + \ln z$, $x = v^2/u$, $y = u + v$, $z = \cos u$.

$$W = xy + \ln z$$

$$= \left( \frac{v^2}{u} (u+v) \right) + \ln (\cos u)$$

$$= v^2 + \frac{v^3}{u} + \ln (\cos u)$$

$$\frac{\partial w}{\partial v} = \frac{\partial}{\partial v} \left( v^2 + \frac{v^3}{u} + \ln (\cos u) \right)$$

$$= 2v + \frac{3v^2}{u} + 0$$

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

$$= 2 \cdot 2 + \frac{3(2^2)}{-1}$$

$$= 4 + \frac{12}{-1}$$

$$= 4 - 12$$

$$= \boxed{-8}$$

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