14.4, number 37: **Find** $\frac{\partial w}{\partial v}$ **at** $(u, v) = (0, 0)$ **if** $w = x^2 + \frac{y}{x}$**,** $x = u - 2v + 1$**, and** $y = 2u + v - 2$**.**

Answer: We see that

$$\begin{aligned} w &= x^2 + \frac{y}{x} \\ &= (u - 2v + 1)^2 + \frac{2u + v - 2}{u - 2v + 1}, \\ \frac{\partial w}{\partial v} &= 2(u - 2v + 1)(-2) + \frac{(u - 2v + 1)(1) - (2u + v - 2)(-2)}{(u - 2v + 1)^2}, \end{aligned}$$

and

$$\frac{\partial w}{\partial v}\Big|_{\substack{u=0 \\ v=0}} = 2(1)(-2) + \frac{(1)(1) - (-2)(-2)}{(1)^2} = -4 - 3 = \boxed{-7}$$