

Math 5B - Weekly quiz VI  
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Grade:     /3

Evaluate the double integral  $\iint_R (x+y)^{-2} dA$  over the rectangle  $R = \{(x,y) \mid 1 \leq x \leq 2, 0 \leq y \leq 1\}$ .

$$\begin{aligned} & \int_0^1 \int_1^2 (x+y)^{-2} dx dy \\ &= \int_0^1 \left. -(x+y)^{-1} \right|_1^2 dy \\ &= \int_0^1 \left[ -(2+y)^{-1} + (1+y)^{-1} \right] dy \\ &= \left[ -\ln|2+y| + \ln|1+y| \right] \Big|_0^1 \\ &= -\ln|3| + \ln|2| \\ &\quad - \left[ -\ln|2| + \ln|1| \right] = \ln|2| + \ln|2| - \ln|3| \\ &= \boxed{\ln \left| \frac{4}{3} \right|} \end{aligned}$$