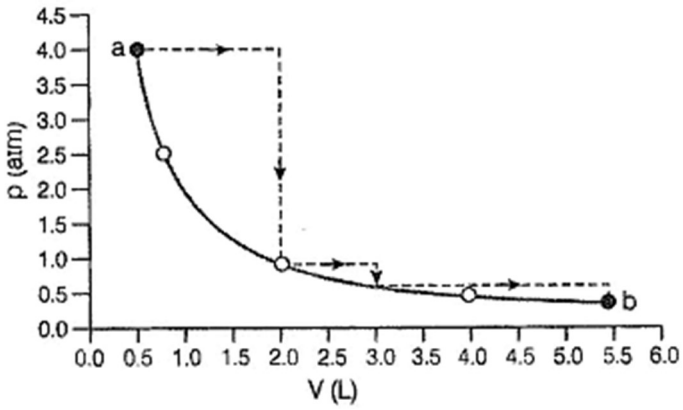
Q. One mole of ideal gas is taken from a to b along two paths denoted by solid and dashed line as shown in the figure below. If the work done along the solid line id W_s and along the dashed line is W_d, then the integer closest to ratio W_d/W_s is: (JEE Adv, 2010)



Solution: **2**

Explanation:

Solid line denotes the reversible path.

So, $W_s = -P_1V_1 \ln(V_2/V_1) = - 4*0.5*\ln (5.5/.5)$ [where 1 denotes point a]

$=4.796$ L atm

Dashed line is the irreversible path and $W_{irrev} = - P_1*(V_2-V_1)$

So, $W_d = -4*(2-0.5) -1*(3-2) -0.5*(5.5-3) =-8.25$ L atm

So, $W_d/W_s = 8.25/4.796 =1.72 \approx 2$