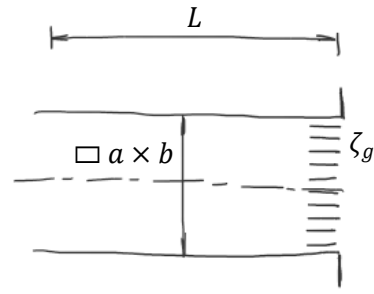


Air is transported to a room through a ventilation duct, as shown in the image. The duct has a length L , and its cross-section is rectangular, with side lengths a and b . For safety reasons, there is a grill at the end of the duct, which has a loss coefficient ζ_g . The hydraulic roughness of the duct walls is k . The velocity at the beginning of the duct is v_1 .



DATA

$L = 12 \text{ m}$, $a = 0.3 \text{ m}$, $b = 0.5 \text{ m}$, $\zeta_g = 0.6$, $k = 0.5 \text{ mm}$, $v_1 = 8 \text{ m/s}$, $\rho = 1.2 \text{ kg/m}^3$,
 $\nu = 15 \cdot 10^{-6} \text{ m}^2/\text{s}$

ASSIGNMENT

What the overpressure needs to be generated at the beginning of the duct?