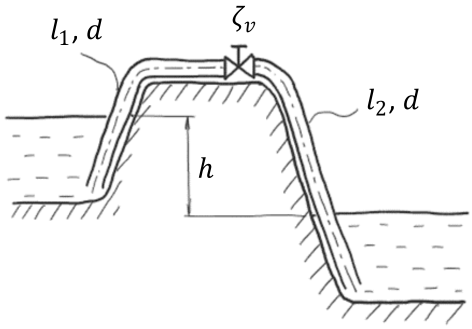
As shown in the image, a lake is connected to a reservoir through a pipe. There is no pressure loss at the inlet of the pipe due to its streamlined design. The diameter d of the pipe is constant all throughout the pipe. The pipe has a tap valve at the top in case the flow needs to be stopped. According to a requirement, the water needs to be transported to the lake by a volumetric flow rate q_v. The pipe is hydraulically smooth, and the pipe friction coefficient λ may be calculated using the Blasius formula. The allowed maximum error of the velocity estimation is ε_{max}.



DATA
$l_1 = 8\ m$, $l_2 = 6\ m$, $h = 3\ m$, $k = 0\ mm$, $\zeta_v = 3.5$, $\nu = 1.3 \cdot 10^{-6}\ m^2/s$, $\rho = 1000\ kg/m^3$, $q_v = 18\ m^3/h$, $g = 10\ N/kg$, $\varepsilon_{max} = 5\ \%$

ASSIGNMENT
What should the diameter d be in order to meet the requirement?