

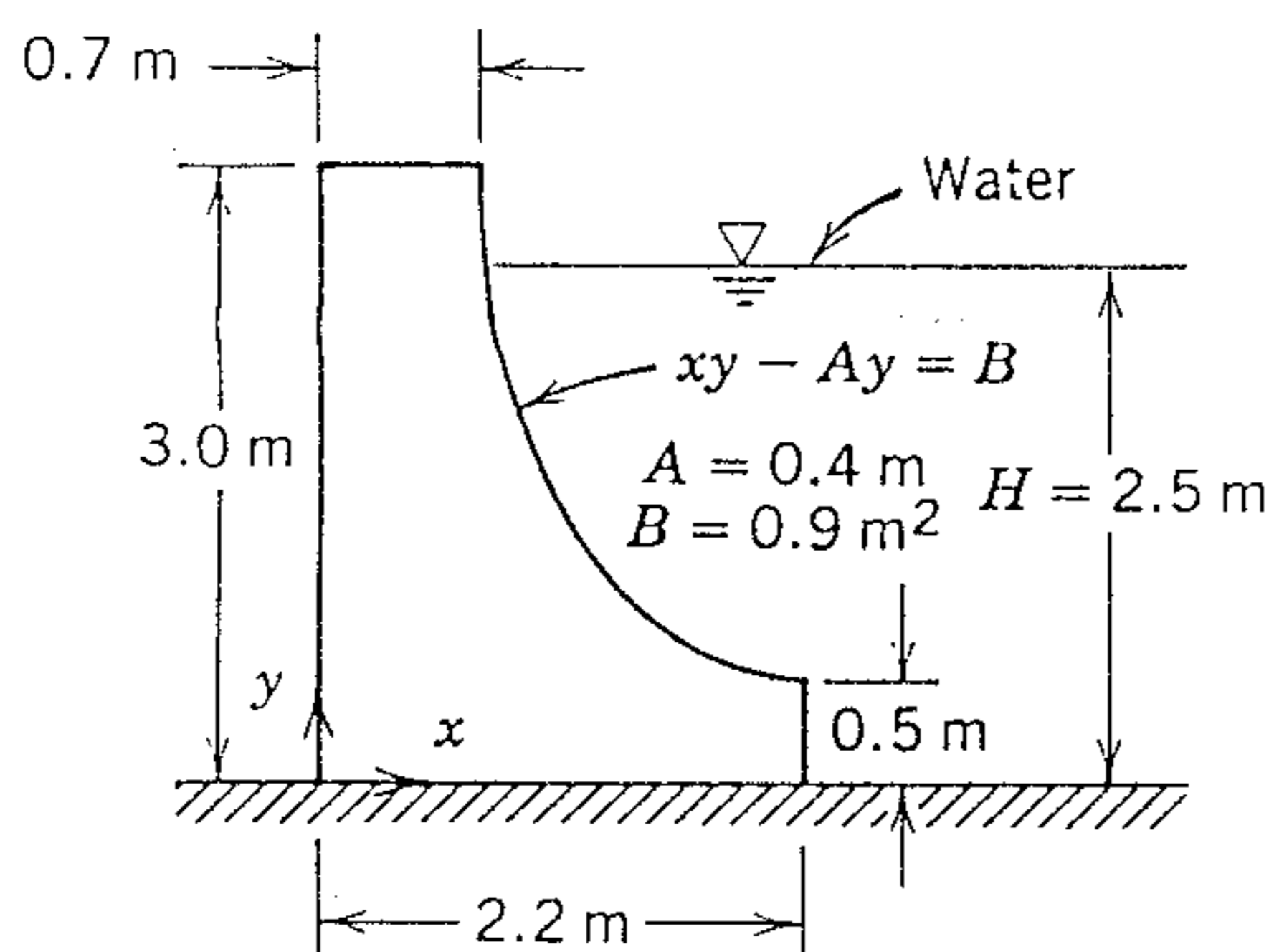
一、解釋名詞或簡答題

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1. Fluid 之定義？與 Solid 之差異？
2. 什麼是 Steady flow？什麼是 Uniform flow？
3. 什麼是 Newtonian fluid？什麼是 Laminar flow？什麼是 Turbulent flow？
4. 什麼是 Normal stress？什麼是 Shear stress？為何在探討 Fluid Statics 時無需考慮 Shear stress？
5. 什麼是 Navier-Stokes equations (無需寫出公式)？Euler's equations？
6. 說明作 Dimensional analysis 之目的？什麼是 Incomplete similarity？
7. 在 pipe flow 中，turbulent flow 與 laminar flow 之 fully developed velocity profiles 有何不同？為何有此不同？
8. 探討 pipe flow 中，說明 Moody diagram 之用途？什麼是 one-seventh power profile？

二 A dam is to be constructed across the Wabash River using the cross section shown. For water height  $H = 2.5$  m, calculate the magnitude and line of action of the vertical force of water on the dam face. Assume the dam width is  $w = 50$  m.

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三 A vane/slider assembly moves under the influence of a liquid jet as shown. The coefficient of kinetic friction for motion of the slider along the surface is  $\mu_k = 0.30$ . Calculate (a) the acceleration of the slider at the instant when  $U = 10$  m/s and (b) the terminal speed of the slider.

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