Solution 3.1

1) Calcul de Q si $y_c = 1,50$ m

$A_c = (b+my_c)y_c = (5+2\times 1,5)1,5 = 12 \text{ m}^2$

$T_c = b+2my_c = 5+2\times 2\times 1,5 = 11$ m

De l'éq. (3.9) :

$$\alpha\frac{Q^2}{g} = \frac{A_c^3}{T_c} \Rightarrow Q = \frac{gA_c^3}{\alpha T_c} = \frac{9,81\times 12^3}{1\times 11}$$

$\boxed{Q = 39,26 \text{ m}^3/\text{s}}$.

2) Calcul de F_r quand $y = 2$ m

$A = (b+my)y = (5+2\times 2)2 = 18$

$T = b+2my = 5+2\times 2\times 2 = 13$

$$D = \frac{A}{T} = \frac{18}{13} = 1,38$$

$$V = \frac{Q}{A} = \frac{39,26}{18} = 2,18$$

$$F_r = \frac{V}{\sqrt{\frac{1}{\alpha}g\cdot D\cos\phi}} = \frac{2,18}{\sqrt{\frac{1}{1}9,81\times 1,38}}$$

$\boxed{F_r = 0,59 < 1}$, l'écoulement est donc fluvial. ■