

Given $b = 3 \text{ m}$ also $n = 0.017$
 $S = 0.017$ $Q = 15.0 \text{ m}^3/\text{s}$

Area $= by = 3y$
 wetted perimeter $P = \cancel{b+2} \quad P = 6$

Hydraulic mean depth $R = \frac{A}{P} = \frac{3y}{6} = \frac{1}{2}y$

Velocity $= V = \frac{Q}{A} = \frac{15}{3y} = \frac{5}{y}$

Manning formular for velocity $V = \frac{1}{n} S^{\frac{1}{2}} R^{\frac{2}{3}}$

$= \frac{5}{y} = \frac{1}{0.017} \times 0.017^{\frac{1}{2}} \times \left(\frac{1}{2}y\right)^{\frac{2}{3}}$

$\times \frac{5}{y} = 4.8316 y^{\frac{2}{3}}$

$\frac{5}{4.8316} = y^{\frac{5}{3}}$

$y = \sqrt[5]{\left(\frac{5}{4.8316}\right)^3}$

$y = 1.02077 \text{ m}$

Therefore, Normal depth of flow $= 1.02077 \text{ m}$