

Darcy Weisbach equation

$$\bar{U} = \sqrt{\frac{8gRS}{f}}$$

$$[L T^{-1}] = \left(\frac{[1][L T^{-2}][\frac{L^2}{[L]}][1]}{[1]} \right)^{\frac{1}{2}}$$

$$[L T^{-1}] = \left([L T^{-2}] \frac{[L^2]}{[L]} \right)^{\frac{1}{2}}$$

$$[L T^{-1}] = \left([L^2 T^{-2}] \right)^{\frac{1}{2}}$$

$$[L T^{-1}] = [L T^{-1}]$$

Manning's equation

$$\bar{U} = \frac{k}{n} R^{\frac{2}{3}} S^{\frac{1}{2}}$$

$$[L T^{-1}] = \frac{[1]}{[1]} \left(\frac{[L^2]}{[L]} \right)^{\frac{2}{3}} ([1])^{\frac{1}{2}}$$

$$[L T^{-1}] = \left(\frac{[L^2]}{[L]} \right)^{\frac{2}{3}}$$

$$[L T^{-1}] = \left[L^{\frac{2}{3}} \right] = \frac{[L^2]}{[L^{\frac{3}{2}}]}$$