

Important Computation of Uniform Flow Formulas PDF



Formulas Examples with Units

List of 19 Important Computation of Uniform Flow Formulas

1) Area of Channel Section by Manning's Formula Formula

Formula

$$A_{cs} = \frac{C_f}{\left(\frac{1}{n}\right) \cdot \left(R_H^{\frac{2}{3}}\right)}$$

Example with Units

$$6.1404 \text{ m}^2 = \frac{700}{\left(\frac{1}{0.012}\right) \cdot \left(1.6 \text{ m}^{\frac{2}{3}}\right)}$$

Evaluate Formula

2) Area of Channel Section given Conveyance of Channel Section Formula

Formula

$$A_{cs} = \frac{C_f}{C \cdot \sqrt{R_H}}$$

Example with Units

$$13.835 \text{ m}^2 = \frac{700}{40 \cdot \sqrt{1.6 \text{ m}}}$$

Evaluate Formula

3) Area of Channel Section given Discharge Formula

Formula

$$A_{cs} = \frac{Q}{C \cdot \sqrt{R_H \cdot S}}$$

Example with Units

$$13.835 \text{ m}^2 = \frac{14 \text{ m}^3/\text{s}}{40 \cdot \sqrt{1.6 \text{ m} \cdot 0.0004}}$$

Evaluate Formula

4) Bed Slope given Conveyance Factor Formula

Formula

$$S = \left(\frac{Q}{C_f}\right)^2$$

Example with Units

$$0.0004 = \left(\frac{14 \text{ m}^3/\text{s}}{700}\right)^2$$

Evaluate Formula

5) Bed Slope of Channel Section given Discharge Formula

Formula

$$S = \frac{\left(\frac{Q}{C \cdot A_{cs}}\right)^2}{R_H}$$

Example with Units

$$0.0003 = \frac{\left(\frac{14 \text{ m}^3/\text{s}}{40 \cdot 15 \text{ m}^2}\right)^2}{1.6 \text{ m}}$$

Evaluate Formula



6) Chezy Constant given Conveyance of Channel Section Formula

Formula

$$C = \frac{C_f}{A_{cs} \cdot \sqrt{R_H}}$$

Example with Units

$$36.8932 = \frac{700}{15 \text{ m}^2 \cdot \sqrt{1.6 \text{ m}}}$$

Evaluate Formula 

7) Chezy Constant given Discharge Formula

Formula

$$C = \frac{Q}{A_{cs} \cdot \sqrt{R_H \cdot S}}$$

Example with Units

$$36.8932 = \frac{14 \text{ m}^3/\text{s}}{15 \text{ m}^2 \cdot \sqrt{1.6 \text{ m} \cdot 0.0004}}$$

Evaluate Formula 

8) Conveyance given Discharge Formula

Formula

$$C_f = \frac{Q}{\sqrt{S}}$$

Example with Units

$$700 = \frac{14 \text{ m}^3/\text{s}}{\sqrt{0.0004}}$$

Evaluate Formula 

9) Conveyance of Channel Section Formula

Formula

$$C_f = C \cdot A_{cs} \cdot \sqrt{R_H}$$

Example with Units

$$758.9466 = 40 \cdot 15 \text{ m}^2 \cdot \sqrt{1.6 \text{ m}}$$

Evaluate Formula 

10) Discharge given Conveyance Formula

Formula

$$Q = C_f \cdot \sqrt{S}$$

Example with Units

$$14 \text{ m}^3/\text{s} = 700 \cdot \sqrt{0.0004}$$

Evaluate Formula 

11) Discharge through Channel Formula

Formula

$$Q = C \cdot A_{cs} \cdot \sqrt{R_H \cdot S}$$

Example with Units

$$15.1789 \text{ m}^3/\text{s} = 40 \cdot 15 \text{ m}^2 \cdot \sqrt{1.6 \text{ m} \cdot 0.0004}$$

Evaluate Formula 

12) Hydraulic Radius of Channel Section given Conveyance of Channel Section Formula

Formula

$$R_H = \left(\frac{C_f}{C \cdot A_{cs}} \right)^2$$

Example with Units

$$1.3611 \text{ m} = \left(\frac{700}{40 \cdot 15 \text{ m}^2} \right)^2$$

Evaluate Formula 



13) Hydraulic Radius of Channel Section given Discharge Formula

Formula

$$R_H = \frac{\left(\frac{Q}{C \cdot A_{cs}} \right)^2}{S}$$

Example with Units

$$1.3611 \text{ m} = \frac{\left(\frac{14 \text{ m}^3/\text{s}}{40 \cdot 15 \text{ m}^2} \right)^2}{0.0004}$$

Evaluate Formula 

14) Manning's Formula for Bed Slope given Discharge Formula

Formula

$$S = \left(\frac{Q}{C_f} \right)^2$$

Example with Units

$$0.0004 = \left(\frac{14 \text{ m}^3/\text{s}}{700} \right)^2$$

Evaluate Formula 

15) Manning's Formula for Conveyance given Discharge Formula

Formula

$$C_f = \frac{Q}{\sqrt{S}}$$

Example with Units

$$700 = \frac{14 \text{ m}^3/\text{s}}{\sqrt{0.0004}}$$

Evaluate Formula 

16) Manning's Formula for Conveyance of Section Formula

Formula

$$C_f = \left(\frac{1}{n} \right) \cdot A_{cs} \cdot \left(R_H^{\frac{2}{3}} \right)$$

Example with Units

$$1709.9759 = \left(\frac{1}{0.012} \right) \cdot 15 \text{ m}^2 \cdot \left(1.6 \text{ m}^{\frac{2}{3}} \right)$$

Evaluate Formula 

17) Manning's Formula for Discharge given Conveyance Formula

Formula

$$Q = C_f \cdot \sqrt{S}$$

Example with Units

$$14 \text{ m}^3/\text{s} = 700 \cdot \sqrt{0.0004}$$

Evaluate Formula 

18) Manning's Formula for Hydraulic Radius of Channel Section given Conveyance of Section Formula

Formula

$$R_H = \left(\frac{C_f}{\left(\frac{1}{n} \right) \cdot A_{cs}} \right)^{\frac{3}{2}}$$

Example with Units

$$0.4191 \text{ m} = \left(\frac{700}{\left(\frac{1}{0.012} \right) \cdot 15 \text{ m}^2} \right)^{\frac{3}{2}}$$

Evaluate Formula 



19) Manning's Formula for Roughness Coefficient given Conveyance of Section Formula

Formula

$$n = \left(\frac{1}{C_f} \right) \cdot A_{cs} \cdot \left(R_H^{\frac{2}{3}} \right)$$

Example with Units

$$0.0293 = \left(\frac{1}{700} \right) \cdot 15 \text{ m}^2 \cdot \left(1.6 \text{ m}^{\frac{2}{3}} \right)$$




Evaluate Formula 



Variables used in list of Computation of Uniform Flow Formulas above

- **A_{CS}** Cross-Sectional Area of Channel (Square Meter)
- **C** Chezy's Constant
- **C_f** Conveyance Factor
- **n** Manning's Roughness Coefficient
- **Q** Discharge of Channel (Cubic Meter per Second)
- **R_H** Hydraulic Radius of Channel (Meter)
- **S** Bed Slope

Constants, Functions, Measurements used in list of Computation of Uniform Flow Formulas above

- **Functions:** **sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Area** in Square Meter (m²)
Area Unit Conversion 
- **Measurement:** **Volumetric Flow Rate** in Cubic Meter per Second (m³/s)
Volumetric Flow Rate Unit Conversion 



Download other Important Flow in Open Channels PDFs

- [Important Computation of Uniform Flow Formulas](#) 
- [Important Metering Flumes and Momentum in Open-Channel Flow Specific Force Formulas](#) 
- [Important Critical Flow and its Computation Formulas](#) 
- [Important Specific Energy and Critical Depth Formulas](#) 
- [Important Geometrical Properties of Channel Section Formulas](#) 

Try our Unique Visual Calculators

-  [Percentage error](#) 
-  [LCM of three numbers](#) 
-  [Subtract fraction](#) 

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

7/8/2024 | 9:09:33 AM UTC

