



# Basic Equations of Flood Routing Formulas

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## List of 16 Basic Equations of Flood Routing Formulas

### Basic Equations of Flood Routing C





fx 
$$I_{\mathrm{avg}} = rac{\Delta \mathrm{Sv} + \mathrm{Q}_{\mathrm{avg}} \cdot \Delta \mathrm{t}}{\Delta \mathrm{t}}$$

ex 
$$60 \text{m}^3/\text{s} = rac{20 + 56 \text{m}^3/\text{s} \cdot 5\text{s}}{5\text{s}}$$

Open Calculator

#### 3) Average Outflow Denoting Beginning and End of Time Interval

fx 
$$Q_{
m avg}=rac{Q_1+Q_2}{2}$$
 Open Calculator  $ar{C}$   
ex  $56{
m m}^3/{
m s}=rac{48{
m m}^3/{
m s}+64{
m m}^3/{
m s}}{2}$ 





4) Average Outflow in Time given Change in Storage 🖸

$$f_{X} Q_{avg} = \frac{I_{avg} \cdot \Delta t - \Delta Sv}{\Delta t}$$

$$e_{X} 56m^{3}/s = \frac{60m^{3}/s \cdot 5s - 20}{5s}$$

$$Q_{avg} = \frac{60m^{3}/s \cdot 5s - 20}{5s}$$

5) Change in Storage Denoting Beginning and End of Time Interval

fx 
$$\Delta \mathrm{Sv} = \mathrm{S}_2 - \mathrm{S}_1$$
 Open Calculator  $oldsymbol{\mathbb{C}}$ 

ex 20 = 35 - 15

6) Change in Storage Denoting Beginning and End of Time Interval concerning Inflow and Outflow

$$\Delta \mathrm{Sv} = \left(rac{\mathrm{I}_1 + \mathrm{I}_2}{2}
ight) \cdot \Delta \mathrm{t} - \left(rac{\mathrm{Q}_1 + \mathrm{Q}_2}{2}
ight) \cdot \Delta \mathrm{t}$$
 Open Calculator

$$\exp 20 = \left(rac{55 {
m m}^3/{
m s} + 65 {
m m}^3/{
m s}}{2}
ight) \cdot 5 {
m s} - \left(rac{48 {
m m}^3/{
m s} + 64 {
m m}^3/{
m s}}{2}
ight) \cdot 5 {
m s}$$

7) Inflow at Beginning of Time Interval given Average Inflow 🚰

fx 
$$\mathrm{I}_1 = 2 \cdot \mathrm{I}_{\mathrm{avg}} - \mathrm{I}_2$$

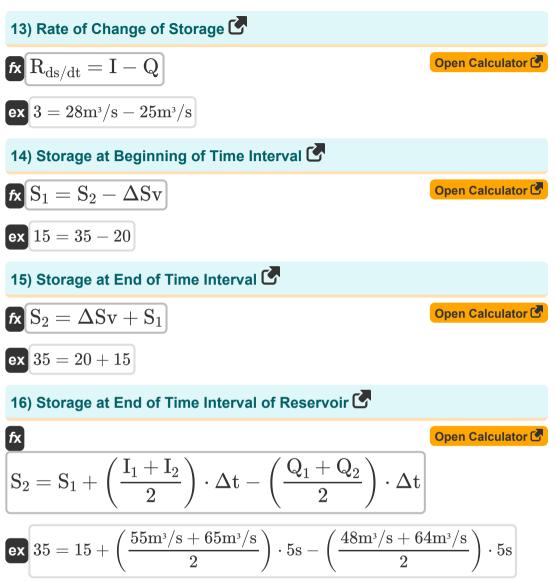
ex 
$$55 {
m m}^3/{
m s} = 2 \cdot 60 {
m m}^3/{
m s} - 65 {
m m}^3/{
m s}$$



Open Calculator

8) Inflow at End of Time Interval given Average Inflow   
(a) Inflow at End of Time Interval given Average Inflow   
(b) Inflow Rate given Rate of Change of Storage   
(c) I = 
$$R_{ds/dt} + Q$$
  
(c) Qeen Calculator   
(c) Qee







# Variables Used

- I Inflow Rate (Cubic Meter per Second)
- I<sub>1</sub> Inflow at the Beginning of Time Interval (Cubic Meter per Second)
- I2 Inflow at the End of Time Interval (Cubic Meter per Second)
- **I**avg Average Inflow (Cubic Meter per Second)
- **Q** Outflow Rate (Cubic Meter per Second)
- **Q<sub>1</sub>** Outflow at the Beginning of Time Interval (Cubic Meter per Second)
- Q2 Outflow at the End of Time Interval (Cubic Meter per Second)
- Qava Average Outflow (Cubic Meter per Second)
- Rds/dt Rate of Change of Storage
- S<sub>1</sub> Storage at the Beginning of Time Interval
- **S**<sub>2</sub> Storage at the End of Time Interval
- ΔSv Change in Storage Volumes
- Δt Time Interval (Second)





### **Constants, Functions, Measurements used**

- Measurement: Time in Second (s) Time Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m<sup>3</sup>/s) Volumetric Flow Rate Unit Conversion



### Check other formula lists

- Basic Equations of Flood Routing Hydrograph) Formulas 
   Formulas 
   Hydrologic Routing Formulas
- Clark's Method and Nash Model for IUH (Instantaneous Unit

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