



Peak Drainage Discharge Formula Formulas

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List of 18 Peak Drainage Discharge Formula Formulas

Peak Drainage Discharge Formula 🗗

Peak Drainage Discharge by Empirical Formula 🗗

Burkli Ziegler Formula

1) Drainage Area for Peak Rate of Runoff

$$\mathbf{K} \mathbf{A}_{\mathrm{D}} = \left(rac{\mathbf{Q}_{\mathrm{BZ}} \cdot 455}{\mathbf{K}' \cdot \mathbf{I}_{\mathrm{BZ}} \cdot \sqrt{\mathbf{S}_{\mathrm{o}}}}
ight)^{2}$$

Open Calculator 🗗

2) Maximum Rainfall Intensity given Peak Rate of Runoff

$$I_{
m BZ} = 455 \cdot rac{
m Q_{BZ}}{
m K' \cdot \sqrt{
m S_o \cdot A_D}}$$

Open Calculator

$$ext{ex} \ 0.002083 ext{cm/h} = 455 \cdot rac{1.34 ext{m}^3/ ext{s}}{251878.2 \cdot \sqrt{0.045 \cdot 30 ext{ha}}}$$





3) Peak Rate of Runoff from Burkli-Ziegler Formula

Open Calculator 2

$$egin{aligned} \mathbf{R} \ \mathbf{Q}_{\mathrm{BZ}} = \left(rac{\mathrm{K'}\cdot\mathrm{I}_{\mathrm{BZ}}\cdot\mathrm{A}_{\mathrm{D}}}{455}
ight)\cdot\sqrt{rac{\mathrm{S}_{\mathrm{o}}}{\mathrm{A}_{\mathrm{D}}}} \end{aligned}$$

4) Runoff Coefficient for Peak Rate of Runoff

$$\text{fx} | \text{K'} = \frac{455 \cdot Q_{BZ}}{I_{BZ} \cdot \sqrt{S_o \cdot A_D}}$$

Open Calculator 2

$$ext{ex} 251878.2 = rac{455 \cdot 1.34 ext{m}^3/ ext{s}}{7.5 ext{cm/h} \cdot \sqrt{0.045 \cdot 30 ext{ha}}}$$

5) Slope of Ground Surface given Peak Rate of Runoff

$$\mathbf{F}_{\mathrm{o}} = \left(rac{\mathrm{Q}_{\mathrm{BZ}}\cdot 455}{\mathrm{I}_{\mathrm{BZ}}\cdot \mathrm{K'}\cdot \sqrt{\mathrm{A}_{\mathrm{D}}}}
ight)^{2}$$

$$oxed{0.045} = \left(rac{1.34 {
m m}^3/{
m s} \cdot 455}{7.5 {
m cm/h} \cdot 251878.2 \cdot \sqrt{30 {
m ha}}}
ight)^2$$



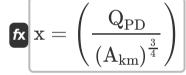
Dicken's Formula

6) Catchment Area given Peak Rate of Runoff

$$\mathbf{A}_{\mathrm{km}} = \left(rac{\mathrm{Q}_{\mathrm{PD}}}{\mathrm{x}}
ight)^{rac{4}{3}}$$

ex
$$2.5 \mathrm{km^2} = \left(\frac{628716.7 \mathrm{m^3/s}}{10} \right)^{\frac{4}{3}}$$

7) Factors Dependent Constant given Peak Rate of Runoff



ex
$$10 = \left(rac{628716.7 ext{m}^3/ ext{s}}{\left(2.5 ext{km}^2
ight)^{rac{3}{4}}}
ight)$$

8) Peak Rate Runoff from Dicken's Formula 🗗

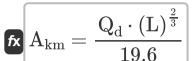
$$\mathbf{K} \mathbf{Q}_{\mathrm{PD}} = \mathbf{x} \cdot (\mathbf{A}_{\mathrm{km}})^{rac{3}{4}}$$

$$ext{ex} \ 628716.7 ext{m}^3/ ext{s} = 10 \cdot (2.5 ext{km}^2)^{rac{3}{4}}$$



Dredge or Burge's Formula

9) Catchment Area given Peak Rate of Runoff from Dredge Formula



Open Calculator 🗗

ex
$$2.5 \text{km}^2 = \frac{212561.2 \text{m}^3/\text{s} \cdot (3.5 \text{km})^{\frac{2}{3}}}{10.6}$$

10) Peak Rate of Runoff from Dredge Formula

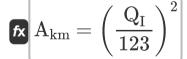


Open Calculator

ex
$$212561.2 \mathrm{m}^3/\mathrm{s} = 19.6 \cdot \left(rac{2.5 \mathrm{km}^2}{(3.5 \mathrm{km})^{rac{2}{3}}}
ight)$$

Inglis Formula 🗗

11) Catchment Area given Peak Rate of Runoff from Inglis Formula



Open Calculator 🗗

$$ext{ex} \left[2.499998 ext{km}^2 = \left(rac{194.48 ext{m}^3/ ext{s}}{123}
ight)^2
ight]$$





12) Peak Rate of Runoff from Inglis Formula Approximate



Open Calculator 🚰

ex $194.4801 \mathrm{m}^3/\mathrm{s} = 123 \cdot \sqrt{2.5 \mathrm{km}^2}$

Nawab Jung Bahadur Formula 🗗



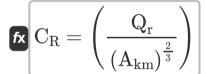


Open Calculator 🗗

ex $125.6423 \mathrm{m}^3/\mathrm{s} = 55 \cdot (2.5 \mathrm{km}^2)^{0.93 - (rac{1}{14}) \cdot \log 10 (2.5 \mathrm{km}^2)}$

Ryve's Formula 🗗

14) Factors Dependent Constant from Ryve's Formula



Open Calculator

$$oxed{ex} 6.786044 = \left(rac{125000 \mathrm{m}^3/\mathrm{s}}{\left(2.5 \mathrm{km}^2
ight)^{rac{2}{3}}}
ight)$$



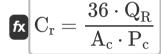
Peak Drainage Discharge by Rational Formula 🗗

15) Catchment Area given Peak Rate of Runoff and Rainfall Intensity

$$\mathbf{A}_{\mathrm{c}} = rac{36 \cdot \mathrm{Q_R}}{\mathrm{C_r} \cdot \mathrm{P_c}}$$

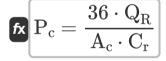
$$\boxed{ 14.92539 ha = \frac{36 \cdot 4166.67 m^3/s}{0.5 \cdot 2.01 cm/h} }$$

16) Coefficient of Runoff given Peak Rate of Runoff



$$0.497513 = rac{36 \cdot 4166.67 ext{m}^3/ ext{s}}{15 ext{ha} \cdot 2.01 ext{cm/h}}$$

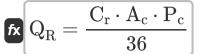
17) Critical Rainfall Intensity for Peak Rate of Runoff



$$ext{ex} \ 2.000002 ext{cm/h} = rac{36 \cdot 4166.67 ext{m}^3/ ext{s}}{15 ext{ha} \cdot 0.5}$$



18) Peak Rate of Runoff in Rational Formula 🚰



Open Calculator 🗗

$$ext{ex} egin{aligned} ext{4187.5m}^3/ ext{s} &= rac{0.5 \cdot 15 ext{ha} \cdot 2.01 ext{cm/h}}{36} \end{aligned}$$



Variables Used

- A_c Area of Catchment (Hectare)
- An Drainage Area (Hectare)
- A_{km} Catchment Area in KM (Square Kilometer)
- C₂ Coefficient
- C_r Runoff Coefficient
- C_R Ryve's Coefficient
- I_{BZ} Intensity of Rainfall in Burkli Zeigler (Centimeter per Hour)
- K' Runoff Coefficient for Burkli Zeigler
- L Length of Drain (Kilometer)
- Pc Critical Rainfall Intensity (Centimeter per Hour)
- QBZ Peak Rate of Runoff for Burkli Zeigler (Cubic Meter per Second)
- Q_d Peak Rate of Runoff from Dredge Formula (Cubic Meter per Second)
- Q_I Peak Rate of Runoff for Inglish (Cubic Meter per Second)
- Q_{NJB} Peak Rate of Runoff for Nawab Jung Bahadur (Cubic Meter per Second)
- QPD Peak Rate of Runoff from Dickens Formula (Cubic Meter per Second)
- Q_r Peak Rate of Runoff in ryves formula (Cubic Meter per Second)
- Q_R Peak Drainage Discharge by Rational Formula (Cubic Meter per Second)
- S_o Slope of the ground
- X Constant





Constants, Functions, Measurements used

- Function: log10, log10(Number)

 The common logarithm, also known as the base-10 logarithm or the decimal logarithm, is a mathematical function that is the inverse of the exponential function.
- Function: 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 Kilometer (km)
 Length Unit Conversion
- Measurement: Area in Hectare (ha), Square Kilometer (km²)
 Area Unit Conversion
- Measurement: Speed in Centimeter per Hour (cm/h)
 Speed Unit Conversion
- Measurement: Volumetric Flow Rate in Cubic Meter per Second (m³/s)

 Volumetric Flow Rate Unit Conversion





Check other formula lists

Peak Drainage Discharge Formula
 Formulas

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