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SCS Triangular Unit Hydrograph Formulas

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List of 13 SCS Triangular Unit Hydrograph Formulas

SCS Triangular Unit Hydrograph

1) Base Length in SCS Triangular Unit Hydrograph

Open Calculator

fx $$T_b = 2.67 \cdot T_p$$

ex $$18.69\text{m} = 2.67 \cdot 7\text{h}$$

2) Catchment Area given Peak Discharge

Open Calculator

fx $$A = T_p \cdot \frac{Q_p}{2.08}$$

ex $$2.998558\text{km}^2 = 7\text{h} \cdot \frac{0.891\text{m}^3/\text{s}}{2.08}$$

3) Duration of Effective Rainfall for given Time of Peak

Open Calculator

fx $$t_r = 2 \cdot (T_p - 0.6 \cdot t_c)$$

ex $$2\text{h} = 2 \cdot (7\text{h} - 0.6 \cdot 10\text{h})$$

4) Duration of Effective Rainfall given Time of Peak

Open Calculator

fx $$t_r = 2 \cdot (T_p - t_p)$$

ex $$2\text{h} = 2 \cdot (7\text{h} - 6\text{h})$$

5) Lag Time given Time of Peak

Open Calculator

fx $$t_p = T_p - \frac{t_r}{2}$$

ex $$6h = 7h - \frac{2h}{2}$$

6) Peak Discharge

Open Calculator

fx $$Q_p = 2.08 \cdot \frac{A}{T_p}$$

ex $$0.891429m^3/s = 2.08 \cdot \frac{3.00km^2}{7h}$$

7) Time of Concentration given Time of Peak

Open Calculator

fx $$t_c = \frac{T_p - \left(\frac{t_r}{2}\right)}{0.6}$$

ex $$10h = \frac{7h - \left(\frac{2h}{2}\right)}{0.6}$$

8) Time of Peak given Base Length

Open Calculator

fx $$T_p = \frac{T_b}{2.67}$$

ex $$7h = \frac{18.69m}{2.67}$$

9) Time of Peak given Peak Discharge

Open Calculator

fx $$T_p = 2.08 \cdot \frac{A}{Q_p}$$

ex $$0.001945\text{h} = 2.08 \cdot \frac{3.00\text{km}^2}{0.891\text{m}^3/\text{s}}$$

10) Time of Peak given Time of Concentration

Open Calculator

fx $$T_p = 0.6 \cdot t_c + \frac{t_r}{2}$$

ex $$7\text{h} = 0.6 \cdot 10\text{h} + \frac{2\text{h}}{2}$$

11) Time of Peak given Time of Recession

Open Calculator

fx $$T_p = \frac{Tc}{1.67}$$

ex $$7.185629\text{h} = \frac{12\text{h}}{1.67}$$

12) Time of Peak or Time of Rise

Open Calculator

fx $$T_p = \left(\frac{t_r}{2}\right) + t_p$$

ex $$7\text{h} = \left(\frac{2\text{h}}{2}\right) + 6\text{h}$$

13) Time of Recession as Suggested in SCS

Open Calculator

fx $$\mathrm{Tc} = 1.67 \cdot \mathrm{T_p}$$

ex $$11.69\mathrm{h} = 1.67 \cdot 7\mathrm{h}$$

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Variables Used

- **A** Area of Catchment *(Square Kilometer)*
- **Q_p** Peak Discharge *(Cubic Meter per Second)*
- **T_b** Base Length *(Meter)*
- **t_c** Time of Concentration *(Hour)*
- **t_p** Basin Lag *(Hour)*
- **T_p** Time of Peak *(Hour)*
- **t_r** Standard Duration of Effective Rainfall *(Hour)*
- **Tc** Time of Recession *(Hour)*

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Constants, Functions, Measurements used

- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Time** in Hour (h)
  Time Unit Conversion
- Measurement: **Area** in Square Kilometer (km^2)
  Area Unit Conversion
- Measurement: **Volumetric Flow Rate** in Cubic Meter per Second (m^3/s)
  Volumetric Flow Rate Unit Conversion

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Check other formula lists

- SCS Triangular Unit Hydrograph Formulas
- Synder's Synthetic- Unit Hydrograph Formulas
- The Indian Practice Formulas

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