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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

$$fx \quad T_b = 2.67 \cdot T_p$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$ex \quad 18.69m = 2.67 \cdot 7h$$

2) Catchment Area given Peak Discharge

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

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

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

3) Duration of Effective Rainfall for given Time of Peak

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

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$ex \quad 2h = 2 \cdot (7h - 0.6 \cdot 10h)$$

4) Duration of Effective Rainfall given Time of Peak

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

[Open Calculator !\[\]\(83bbbd261710c59db0214aa27b2edc0d_img.jpg\)](#)

$$ex \quad 2h = 2 \cdot (7h - 6h)$$



5) Lag Time given Time of Peak 

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

Open Calculator 


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

6) Peak Discharge 

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

Open Calculator 

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

7) Time of Concentration given Time of Peak 

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

Open Calculator 

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


8) Time of Peak given Base Length 

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

Open Calculator 

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




9) Time of Peak given Peak Discharge 

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

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)


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

10) Time of Peak given Time of Concentration 

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

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)


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

11) Time of Peak given Time of Recession 

$$fx \quad T_p = \frac{T_c}{1.67}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

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

12) Time of Peak or Time of Rise 

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

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

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



13) Time of Recession as Suggested in SCS

fx $T_c = 1.67 \cdot T_p$

Open Calculator 

ex $11.69h = 1.67 \cdot 7h$







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)
- **T_c** Time of Recession (Hour)






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 (km²)
Area Unit Conversion 
- **Measurement: Volumetric Flow Rate** in Cubic Meter per Second (m³/s)
Volumetric Flow Rate Unit Conversion 



Check other formula lists

- [SCS Triangular Unit Hydrograph Formulas](#) 
- [Synder's Synthetic- Unit Hydrograph Formulas](#) 
- [The Indian Practice Formulas](#) 

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