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Channel Flow Time and Time of Concentration Formulas

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List of 9 Channel Flow Time and Time of Concentration Formulas

Channel Flow Time and Time of Concentration ⚹

1) Channel Flow Time given Total Time of Concentration ⚹

Open Calculator ⚹

fx $T_{m/f} = t_c - T_i$

ex $19.44\text{min} = 114.22\text{min} - 94.78\text{min}$

2) Channel Flow Time or Gutter Flow Time ⚹

Open Calculator ⚹

fx $T_{m/f} = \dfrac{L}{V}$

ex $19.44444\text{min} = \dfrac{3.5\text{km}}{3\text{m/s}}$

3) Inlet Time given Total Time of Concentration ⚹

Open Calculator ⚹

fx $T_i = t_c - T_{m/f}$

ex $94.78\text{min} = 114.22\text{min} - 19.44\text{min}$

4) Inlet Time or Time of Equilibrium 🔗

fx
$$T_i = \left(0.885 \cdot \left(\frac{(L_{ob})^3}{H} \right) \right)^{0.385}$$

ex
$$94.61658\,min = \left(0.885 \cdot \left(\frac{(4km)^3}{10.05m} \right) \right)^{0.385}$$

5) Length of Drain given Channel Flow Time 🔗

fx $L = T_{m/f} \cdot V$

ex $3.4992km = 19.44min \cdot 3m/s$

6) Length of Overland Flow given Inlet Time 🔗

fx
$$L_{ob} = \left(\frac{(T_i)^{\frac{1}{0.385}} \cdot H}{0.885} \right)^{\frac{1}{3}}$$

ex
$$4.005981km = \left(\frac{(94.78min)^{\frac{1}{0.385}} \cdot 10.05m}{0.885} \right)^{\frac{1}{3}}$$

7) Total Fall of Level from Critical Point to Mouth of Drain given Inlet Time ⤴

Open Calculator ⬈

fx
$$H = \frac{(L_{ob})^3}{\dfrac{(T_i)^{\frac{1}{0.385}}}{0.885}}$$

ex
$$10.00505m = \frac{(4km)^3}{\dfrac{(94.78min)^{\frac{1}{0.385}}}{0.885}}$$

8) Total Time of Concentration ⤴

Open Calculator ⬈

fx $\quad t_c = T_i + T_{m/f}$

ex $\quad 114.22min = 94.78min + 19.44min$

9) Velocity in Drain given Channel Flow Time ⤴

Open Calculator ⬈

fx
$$V = \frac{L}{T_{m/f}}$$

ex
$$3.000686m/s = \frac{3.5km}{19.44min}$$

Variables Used

- **H** Fall of Level *(Meter)*
- **L** Length of Drain *(Kilometer)*
- **L$_{ob}$** Length of Overland Flow *(Kilometer)*
- **t$_c$** Time of Concentration *(Minute)*
- **T$_i$** Inlet Time *(Minute)*
- **T$_{m/f}$** Channel Flow Time *(Minute)*
- **V** Velocity in Drain *(Meter per Second)*

Constants, Functions, Measurements used

- Measurement: **Length** in Kilometer (km), Meter (m)
  Length Unit Conversion

- Measurement: **Time** in Minute (min)
  Time Unit Conversion

- Measurement: **Speed** in Meter per Second (m/s)
  Speed Unit Conversion

Check other formula lists

- **Channel Flow Time and Time of Concentration Formulas** ⬀
- **Peak Drainage Discharge Formula Formulas** ⬀

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