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Flow Over a Trapizoidal and Triangular Weir or Notch Formulas

Calculators! Examples! Conversions!

List of 20 Flow Over a Trapizoidal and Triangular Weir or Notch Formulas

Flow Over a Trapizoidal and Triangular Weir or Notch

Flow Over a Trapizoidal Weir or Notch

1) Additional Head given Discharge for Cipolletti Weir Considering Velocity

Open Calculator

fx $$H_V = \left(H_{Stillwater}^{\frac{3}{2}} - \left(\frac{Q_C}{1.86 \cdot L_w} \right) \right)^{\frac{2}{3}}$$

ex $$5.882555\text{m} = \left((6.6\text{m})^{\frac{3}{2}} - \left(\frac{15\text{m}^3/\text{s}}{1.86 \cdot 3\text{m}} \right) \right)^{\frac{2}{3}}$$

2) Coefficient of Discharge given Discharge for Cipolletti Weir

Open Calculator

fx $$C_d = \frac{Q_C \cdot 3}{2 \cdot \sqrt{2 \cdot g} \cdot L_w \cdot S_w^{\frac{3}{2}}}$$

ex $$0.598947 = \frac{15\text{m}^3/\text{s} \cdot 3}{2 \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot 3\text{m} \cdot (2\text{m})^{\frac{3}{2}}}$$

3) Discharge for Cipolletti Weir

Open Calculator

fx $$Q_C = \left(\frac{2}{3} \right) \cdot C_d \cdot \sqrt{2 \cdot g} \cdot L_w \cdot S_w^{\frac{3}{2}}$$

ex $$16.52901\text{m}^3/\text{s} = \left(\frac{2}{3} \right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot 3\text{m} \cdot (2\text{m})^{\frac{3}{2}}$$

4) Discharge for Cipolletti Weir if Velocity is Considered

Open Calculator

fx $$Q_C = 1.86 \cdot L_w \cdot \left(H_{Stillwater}^{\frac{3}{2}} - H_V^{\frac{3}{2}} \right)$$

ex $$39.56112\text{m}^3/\text{s} = 1.86 \cdot 3\text{m} \cdot \left((6.6\text{m})^{\frac{3}{2}} - (4.6\text{m})^{\frac{3}{2}} \right)$$

5) Discharge over Cipolletti Weir by Francis Cipolletti

Open Calculator

fx $$Q_C = 1.86 \cdot L_w \cdot S_w^{\frac{3}{2}}$$

ex $$15.78262\text{m}^3/\text{s} = 1.86 \cdot 3\text{m} \cdot (2\text{m})^{\frac{3}{2}}$$

6) Discharge over Trapezoidal Notch if overall Coefficient of Discharge for Trapezoidal notch

Open Calculator

fx $$Q_C = \left(\left(C_d \cdot \sqrt{2 \cdot g} \cdot S_w^{\frac{3}{2}}\right) \cdot \left(\left(\frac{2}{3}\right) \cdot L_w + \left(\frac{8}{15}\right) \cdot S_w \cdot \tan\left(\frac{\theta}{2}\right)\right)\right)$$

ex $$18.89111\text{m}^3/\text{s} = \left(\left(0.66 \cdot \sqrt{2 \cdot 9.8\text{m/s}^2} \cdot (2\text{m})^{\frac{3}{2}}\right) \cdot \left(\left(\frac{2}{3}\right) \cdot 3\text{m} + \left(\frac{8}{15}\right) \cdot 2\text{m} \cdot \tan\left(\frac{30°}{2}\right)\right)\right)$$

7) Head given Discharge for Cipolletti Weir

Open Calculator

fx $$S_w = \left(\frac{3 \cdot Q_C}{2 \cdot C_d \cdot \sqrt{2 \cdot g} \cdot L_w}\right)^{\frac{2}{3}}$$

ex $$1.874676\text{m} = \left(\frac{3 \cdot 15\text{m}^3/\text{s}}{2 \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m/s}^2} \cdot 3\text{m}}\right)^{\frac{2}{3}}$$

8) Head given Discharge for Cipolletti Weir using Velocity

Open Calculator

fx $$H_{Stillwater} = \left(\left(\frac{Q_C}{1.86 \cdot L_w}\right) + H_V^{\frac{3}{2}}\right)^{\frac{2}{3}}$$

ex $$5.401608\text{m} = \left(\left(\frac{15\text{m}^3/\text{s}}{1.86 \cdot 3\text{m}}\right) + (4.6\text{m})^{\frac{3}{2}}\right)^{\frac{2}{3}}$$

9) Head given Discharge over Cipolletti Weir

Open Calculator

fx $$S_w = \left(\frac{Q_C}{1.86 \cdot L_w}\right)^{\frac{2}{3}}$$

ex $$1.933324\text{m} = \left(\frac{15\text{m}^3/\text{s}}{1.86 \cdot 3\text{m}}\right)^{\frac{2}{3}}$$

10) Length of Crest given Discharge for Cipolletti Weir

Open Calculator

fx $$L_w = \frac{3 \cdot Q_C}{2 \cdot C_d \cdot \sqrt{2 \cdot g} \cdot S_w^{\frac{3}{2}}}$$

ex $$2.722485\text{m} = \frac{3 \cdot 15\text{m}^3/\text{s}}{2 \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m/s}^2} \cdot (2\text{m})^{\frac{3}{2}}}$$

11) Length of Crest given Discharge over Cipolletti Weir by Francis, Cipolletti

Open Calculator

fx $$L_w = \frac{Q_C}{1.86 \cdot S_w^{\frac{3}{2}}}$$

ex $$2.851237\text{m} = \frac{15\text{m}^3/\text{s}}{1.86 \cdot (2\text{m})^{\frac{3}{2}}}$$

12) Length of Crest when Discharge for Cipolletti Weir and Velocity is Considered

Open Calculator

fx $$L_w = \frac{Q_C}{1.86 \cdot \left(H_{\text{Stillwater}}^{\frac{3}{2}} - H_V^{\frac{3}{2}}\right)}$$

ex $$1.13748\text{m} = \frac{15\text{m}^3/\text{s}}{1.86 \cdot \left((6.6\text{m})^{\frac{3}{2}} - (4.6\text{m})^{\frac{3}{2}}\right)}$$

Flow over a Triangular Weir or Notch

13) Coefficient of Discharge when Discharge for Triangular Weir when Angle is 90

Open Calculator

fx $$C_d = \frac{Q_{tri}}{\left(\frac{8}{15}\right) \cdot \sqrt{2 \cdot g} \cdot S_w^{\frac{5}{2}}}$$

ex $$0.748683 = \frac{10\text{m}^3/\text{s}}{\left(\frac{8}{15}\right) \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot (2\text{m})^{\frac{5}{2}}}$$

14) Discharge for Entire Triangular Weir

Open Calculator

fx $$Q_{tri} = \left(\frac{8}{15}\right) \cdot C_d \cdot \sqrt{2 \cdot g} \cdot \tan\left(\frac{\theta}{2}\right) \cdot S_w^{\frac{5}{2}}$$

ex $$2.362099\text{m}^3/\text{s} = \left(\frac{8}{15}\right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot \tan\left(\frac{30°}{2}\right) \cdot (2\text{m})^{\frac{5}{2}}$$

15) Discharge for Triangular Weir if Angle is at 90

Open Calculator

fx $$Q_{tri} = \left(\frac{8}{15}\right) \cdot C_d \cdot \sqrt{2 \cdot g} \cdot S_w^{\frac{3}{2}}$$

ex $$4.407737\text{m}^3/\text{s} = \left(\frac{8}{15}\right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot (2\text{m})^{\frac{3}{2}}$$

16) Discharge for Triangular Weir if Coefficient Discharge is Constant

Open Calculator

fx $$Q_{tri} = 1.418 \cdot S_w^{\frac{5}{2}}$$

ex $$8.021419\text{m}^3/\text{s} = 1.418 \cdot (2\text{m})^{\frac{5}{2}}$$

17) Discharge for Triangular Weir if Velocity is Considered

Open Calculator

fx $$Q_{tri} = \left(\frac{8}{15}\right) \cdot C_d \cdot \sqrt{2 \cdot g} \cdot \tan\left(\frac{\theta}{2}\right) \cdot \left((S_w + H_V)^{\frac{5}{2}} - H_V^{\frac{5}{2}}\right)$$

ex $$27.77825\text{m}^3/\text{s} = \left(\frac{8}{15}\right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m}/\text{s}^2} \cdot \tan\left(\frac{30°}{2}\right) \cdot \left((2\text{m} + 4.6\text{m})^{\frac{5}{2}} - (4.6\text{m})^{\frac{5}{2}}\right)$$

18) Head for Discharge for Entire Triangular Weir

Open Calculator

$$S_w = \left(\frac{Q_{tri}}{\left(\frac{8}{15}\right) \cdot C_d \cdot \sqrt{2 \cdot g} \cdot \tan\left(\frac{\theta}{2}\right)} \right)^{\frac{2}{5}}$$

$$3.562138\text{m} = \left(\frac{10\text{m}^3/\text{s}}{\left(\frac{8}{15}\right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m/s}^2} \cdot \tan\left(\frac{30°}{2}\right)} \right)^{\frac{2}{5}}$$

19) Head when Coefficient Discharge is Constant

Open Calculator

$$S_w = \left(\frac{Q_{tri}}{1.418} \right)^{\frac{2}{5}}$$

$$2.184387\text{m} = \left(\frac{10\text{m}^3/\text{s}}{1.418} \right)^{\frac{2}{5}}$$

20) Head when Discharge for Triangular Weir Angle is 90

Open Calculator

$$S_w = \frac{Q_{tri}}{\left(\left(\frac{8}{15}\right) \cdot C_d \cdot \sqrt{2 \cdot g}\right)^{\frac{2}{5}}}$$

$$8.373976\text{m} = \frac{10\text{m}^3/\text{s}}{\left(\left(\frac{8}{15}\right) \cdot 0.66 \cdot \sqrt{2 \cdot 9.8\text{m/s}^2}\right)^{\frac{2}{5}}}$$

Variables Used

- C_d Coefficient of Discharge
- g Acceleration due to Gravity *(Meter per Square Second)*
- $H_{Stillwater}$ Still Water Head *(Meter)*
- H_V Velocity Head *(Meter)*
- L_w Length of Weir Crest *(Meter)*
- Q_C Discharge by Cipolletti *(Cubic Meter per Second)*
- Q_{tri} Discharge through Triangular Weir *(Cubic Meter per Second)*
- S_w Height of Water above Crest of Weir *(Meter)*
- θ Theta *(Degree)*

Constants, Functions, Measurements used

- 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.
- Function: **tan**, tan(Angle)
  The tangent of an angle is a trigonometric ratio of the length of the side opposite an angle to the length of the side adjacent to an angle in a right triangle.
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Acceleration** in Meter per Square Second (m/s^2)
  Acceleration Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle Unit Conversion
- Measurement: **Volumetric Flow Rate** in Cubic Meter per Second (m^3/s)
  Volumetric Flow Rate Unit Conversion

Check other formula lists

- **Broad Crested Weir Formulas**
- **Flow Over a Trapizoidal and Triangular Weir or Notch Formulas**
- **Flow Over Rectangular Sharp Crested Weir or Notch Formulas**
- **Submerged Weirs Formulas**
- **Time Required to Empty a Reservoir with Rectangular Weir Formulas**

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