Important Geometrical Properties of Parabolic Channel Section Formulas PDF

Formulas
Examples
with Units

List of 13
Important Geometrical Properties of Parabolic Channel Section Formulas

---

1) Depth of Flow given Hydraulic Depth for Parabola Formula

Formula
$$d_f = D_{Para} \cdot 1.5$$

Example with Units
$$3.3_{\,m} = 2.2_{\,m} \cdot 1.5$$

---

2) Depth of Flow given Section Factor for Parabola Formula

Formula
$$d_f = \left(\frac{Z_{Para}}{0.544331054 \cdot T} \right)^{\frac{2}{3}}$$

Example with Units
$$2.4334_{\,m} = \left(\frac{4.339_{\,m^{\wedge}2.5}}{0.544331054 \cdot 2.1_{\,m}} \right)^{\frac{2}{3}}$$

---

3) Depth of Flow given Top Width for Parabola Formula

Formula
$$d_f = 1.5 \cdot \frac{A_{Para}}{T}$$

Example with Units
$$3.3_{\,m} = 1.5 \cdot \frac{4.62_{\,m^2}}{2.1_{\,m}}$$

---

4) Depth of Flow given Wetted Area for Parabola Formula

Formula
$$d_f = \frac{A_{Para}}{\left(\frac{2}{3} \right) \cdot T}$$

Example with Units
$$3.3_{\,m} = \frac{4.62_{\,m^2}}{\left(\frac{2}{3} \right) \cdot 2.1_{\,m}}$$

---

5) Hydraulic Depth for Parabola Formula

Formula
$$D_{Para} = \left(\frac{2}{3} \right) \cdot d_f$$

Example with Units
$$2.2_{\,m} = \left(\frac{2}{3} \right) \cdot 3.3_{\,m}$$

---

6) Hydraulic Radius given Width Formula ↱

Evaluate Formula ↱

Formula

$$R_{H(Para)} = \frac{2 \cdot (T)^2 \cdot d_f}{3 \cdot (T)^2 + 8 \cdot (d_f)^2}$$

Example with Units

$$0.29\,\text{m} = \frac{2 \cdot (2.1\,\text{m})^2 \cdot 3.3\,\text{m}}{3 \cdot (2.1\,\text{m})^2 + 8 \cdot (3.3\,\text{m})^2}$$

7) Top Width for Parabola Formula ↱

Evaluate Formula ↱

Formula

$$T = 1.5 \cdot \frac{A_{Para}}{d_f}$$

Example with Units

$$2.1\,\text{m} = 1.5 \cdot \frac{4.62\,\text{m}^2}{3.3\,\text{m}}$$

8) Top Width given Hydraulic Radius Formula ↱

Evaluate Formula ↱

Formula

$$T = \sqrt{\frac{8 \cdot (d_f)^2 \cdot R_{H(Para)}}{2 \cdot d_f - 3 \cdot R_{H(Para)}}}$$

Example with Units

$$2.1\,\text{m} = \sqrt{\frac{8 \cdot (3.3\,\text{m})^2 \cdot 0.290045\,\text{m}}{2 \cdot 3.3\,\text{m} - 3 \cdot 0.290045\,\text{m}}}$$

9) Top Width given Wetted Area Formula ↱

Evaluate Formula ↱

Formula

$$T = \frac{A_{Para}}{\left(\frac{2}{3}\right) \cdot d_f}$$

Example with Units

$$2.1\,\text{m} = \frac{4.62\,\text{m}^2}{\left(\frac{2}{3}\right) \cdot 3.3\,\text{m}}$$

10) Top Widths given Section Factor Formula ↱

Evaluate Formula ↱

Formula

$$T = \frac{Z_{Para}}{0.544331054 \cdot \left(d_f^{1.5}\right)}$$

Example with Units

$$1.3297\,\text{m} = \frac{4.339\,\text{m}^{2.5}}{0.544331054 \cdot \left(3.3\,\text{m}^{1.5}\right)}$$

11) Wetted Area Formula ↱

Evaluate Formula ↱

Formula

$$A_{Para} = \left(\frac{2}{3}\right) \cdot T \cdot d_f$$

Example with Units

$$4.62\,\text{m}^2 = \left(\frac{2}{3}\right) \cdot 2.1\,\text{m} \cdot 3.3\,\text{m}$$

12) Wetted Area given Top Width Formula ↱

Evaluate Formula ↱

Formula

$$A_{Para} = T \cdot \frac{d_f}{1.5}$$

Example with Units

$$4.62\,\text{m}^2 = 2.1\,\text{m} \cdot \frac{3.3\,\text{m}}{1.5}$$

Formula

$$P_{Para} = T + \left(\frac{8}{3}\right) \cdot d_f \cdot \frac{d_f}{T}$$

Example with Units

$$15.9286\,m = 2.1\,m + \left(\frac{8}{3}\right) \cdot 3.3\,m \cdot \frac{3.3\,m}{2.1\,m}$$

Variables used in list of Geometrical Properties of Parabolic Channel Section Formulas above

- A_{Para} Wetted Surface Area of Parabola *(Square Meter)*
- d_f Depth of Flow *(Meter)*
- D_{Para} Hydraulic Depth of Parabolic Channel *(Meter)*
- P_{Para} Wetted Perimeter of Parabola *(Meter)*
- $R_{H(Para)}$ Hydraulic Radius of Parabola *(Meter)*
- T Top Width *(Meter)*
- Z_{Para} Section Factor of Parabola *(Meter^2.5)*

Constants, Functions, Measurements used in list of Geometrical Properties of Parabolic Channel Section Formulas above

- Functions: **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 Meter (m)
  Length Unit Conversion ➦
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion ➦
- Measurement: **Section Factor** in Meter^2.5 (m^2.5)
  Section Factor Unit Conversion ➦

Download other Important Geometrical Properties of Channel Section PDFs

- **Important Geometrical Properties of Circular Channel Section Formulas** ↗
- **Important Geometrical Properties of Parabolic Channel Section Formulas** ↗
- **Important Geometrical Properties of Rectangular Channel Section Formulas** ↗
- **Important Geometrical Properties of Trapezoidal Channel Section Formulas** ↗
- **Important Geometrical Properties of Triangular Channel Section Formulas** ↗
- **Important Section modulus, Hydraulic Depth and Practical Channel Sections Formulas** ↗

Try our Unique Visual Calculators

- **Percentage of number** ↗
- **Simple fraction** ↗
- **LCM calculator** ↗

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

English Spanish French German Russian Italian Portuguese Polish Dutch

7/8/2024 | 9:06:13 AM UTC