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Geometrical Properties of Rectangular Channel Section Formulas

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List of 12 Geometrical Properties of Rectangular Channel Section Formulas

Geometrical Properties of Rectangular Channel Section

1) Depth of Flow given Hydraulic Radius in Rectangle

Open Calculator

fx $$D_f = B_{rect} \cdot \frac{R_{H(rect)}}{B_{rect} - 2 \cdot R_{H(rect)}}$$

ex $$5.2\text{m} = 10.4\text{m} \cdot \frac{2.6\text{m}}{10.4\text{m} - 2 \cdot 2.6\text{m}}$$

2) Depth of Flow given Section Factor for Rectangle Channel

Open Calculator

fx $$D_f = \left(\frac{Z_{rect}}{B_{rect}}\right)^{\frac{2}{3}}$$

ex $$5.199961\text{m} = \left(\frac{123.32\text{m}\hat{}2.5}{10.4\text{m}}\right)^{\frac{2}{3}}$$

3) Depth of Flow given Wetted Area for Rectangle

Open Calculator

$$D_f = \frac{A_{rect}}{B_{rect}}$$

ex $$5.2\text{m} = \frac{54.08\text{m}^2}{10.4\text{m}}$$

4) Depth of Flow given Wetted Perimeter for Rectangle

Open Calculator

$$D_f = (P_{rect} - B_{rect}) \cdot 0.5$$

ex $$5.2\text{m} = (20.8\text{m} - 10.4\text{m}) \cdot 0.5$$

5) Hydraulic Radius of Open Channel

Open Calculator

$$R_{H(rect)} = \frac{B_{rect} \cdot D_f}{B_{rect} + 2 \cdot D_f}$$

ex $$2.6\text{m} = \frac{10.4\text{m} \cdot 5.2\text{m}}{10.4\text{m} + 2 \cdot 5.2\text{m}}$$

6) Section Factor for Rectangle

Open Calculator

$$Z_{rect} = B_{rect} \cdot D_f^{1.5}$$

ex $$123.3214\text{m}\hat{}2.5 = 10.4\text{m} \cdot (5.2\text{m})^{1.5}$$

7) Wetted Area for Rectangle

Open Calculator

$$A_{rect} = B_{rect} \cdot D_f$$

$$54.08\text{m}^2 = 10.4\text{m} \cdot 5.2\text{m}$$

8) Wetted Perimeter for Rectangular Section

Open Calculator

$$P_{rect} = B_{rect} + 2 \cdot D_f$$

$$20.8\text{m} = 10.4\text{m} + 2 \cdot 5.2\text{m}$$

9) Width of Section given Hydraulic Radius of Rectangle

Open Calculator

$$B_{rect} = \frac{2 \cdot R_{H(rect)} \cdot D_f}{D_f - R_{H(rect)}}$$

$$10.4\text{m} = \frac{2 \cdot 2.6\text{m} \cdot 5.2\text{m}}{5.2\text{m} - 2.6\text{m}}$$

10) Width of Section given Perimeter

Open Calculator

$$B_{rect} = P_{rect} - 2 \cdot D_f$$

$$10.4\text{m} = 20.8\text{m} - 2 \cdot 5.2\text{m}$$

11) Width of Section given Section Factor

Open Calculator

fx $$B_{rect} = \frac{Z_{rect}}{D_f^{1.5}}$$

ex $$10.39988\text{m} = \frac{123.32\text{m}\hat{}2.5}{(5.2\text{m})^{1.5}}$$

12) Width of Section given Wetted Areas

Open Calculator

fx $$B_{rect} = \frac{A_{rect}}{D_f}$$

ex $$10.4\text{m} = \frac{54.08\text{m}^2}{5.2\text{m}}$$

Variables Used

- A_{rect} Wetted Surface Area of Rectangle *(Square Meter)*
- B_{rect} Width of Section of Rect Channel *(Meter)*
- D_f Depth of Flow of Channel *(Meter)*
- P_{rect} Wetted Perimeter of Rectangle *(Meter)*
- $R_{H(rect)}$ Hydraulic Radius of Rectangle *(Meter)*
- Z_{rect} Section Factor of Rectangle *(Meter^2.5)*

Constants, Functions, Measurements used

- 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

Check other formula lists

- **Geometrical Properties of Circular Channel Section Formulas**
- **Geometrical Properties of Parabolic Channel Section Formulas**
- **Geometrical Properties of Rectangular Channel Section Formulas**

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