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Geometrical Properties of Triangular Channel Section Formulas

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List of 17 Geometrical Properties of Triangular Channel Section Formulas

Geometrical Properties of Triangular Channel Section

1) Depth of Flow for Wetted Perimeter for Triangle

Open Calculator

fx $$d_{f(\Delta)} = \frac{P_{Tri}}{2 \cdot \left(\sqrt{z_{Tri}^2 + 1}\right)}$$

ex $$3.315187\text{m} = \frac{9.33\text{m}}{2 \cdot \left(\sqrt{(0.99)^2 + 1}\right)}$$

2) Depth of Flow given Hydraulic Depth for Triangle

Open Calculator

fx $$d_{f(\Delta)} = D_{H(\Delta)} \cdot 2$$

ex $$3.2\text{m} = 1.6\text{m} \cdot 2$$

3) Depth of Flow given Hydraulic Radius for Triangle

Open Calculator

fx $$d_{f(\Delta)} = R_{H(\Delta)} \cdot 2 \cdot \frac{\sqrt{z_{Tri}^2 + 1}}{z_{Tri}}$$

ex $$3.317487\text{m} = 1.167\text{m} \cdot 2 \cdot \frac{\sqrt{(0.99)^2 + 1}}{0.99}$$

4) Depth of Flow given Section Factor for Triangle Channel

Open Calculator

fx $$d_{f(\Delta)} = \left(Z_{\Delta} \cdot \frac{\sqrt{2}}{z_{Tri}} \right)^{\frac{2}{5}}$$

ex $$3.314386\text{m} = \left(14\text{m}\hat{}2.5 \cdot \frac{\sqrt{2}}{0.99} \right)^{\frac{2}{5}}$$

5) Depth of Flow given Top Width for Triangle

Open Calculator

fx $$d_{f(\Delta)} = \frac{T_{Tri}}{2 \cdot z_{Tri}}$$

ex $$3.333338\text{m} = \frac{6.60001\text{m}}{2 \cdot 0.99}$$

6) Depth of Flow given Wetted Area for Triangle

Open Calculator

$$d_{f(\Delta)} = \sqrt{\frac{A_{Tri}}{z_{Tri}}}$$

$$3.316625\text{m} = \sqrt{\frac{10.89\text{m}^2}{0.99}}$$

7) Hydraulic Depth for Triangle

Open Calculator

$$D_{H(\Delta)} = 0.5 \cdot d_{f(\Delta)}$$

$$1.665\text{m} = 0.5 \cdot 3.33\text{m}$$

8) Hydraulic Radius of Flow

Open Calculator

$$R_{H(\Delta)} = \frac{d_{f(\Delta)} \cdot z_{Tri}}{2 \cdot \sqrt{z_{Tri}^2 + 1}}$$

$$1.171402\text{m} = \frac{3.33\text{m} \cdot 0.99}{2 \cdot \sqrt{(0.99)^2 + 1}}$$

9) Section Factor for Triangle

Open Calculator

fx $$Z_{\Delta} = \frac{z_{Tri} \cdot \left(d_{f(\Delta)}^{2.5}\right)}{\sqrt{2}}$$

ex $$14.16546\text{m}\hat{}2.5 = \frac{0.99 \cdot \left((3.33\text{m})^{2.5}\right)}{\sqrt{2}}$$

10) Side Slope of Section given Hydraulic Radius

Open Calculator

fx $$z_{Tri} = \sqrt{\frac{4 \cdot \left(R_{H(\Delta)}^{2}\right)}{\left(d_{f(\Delta)}^{2}\right) - \left(4 \cdot R_{H(\Delta)}^{2}\right)}}$$

ex $$0.982674 = \sqrt{\frac{4 \cdot \left((1.167\text{m})^{2}\right)}{\left((3.33\text{m})^{2}\right) - \left(4 \cdot (1.167\text{m})^{2}\right)}}$$

11) Side Slope of Section given Section Factor

Open Calculator

fx $$z_{Tri} = \frac{Z_{\Delta}}{\frac{\left(d_{f(\Delta)}^{2.5}\right)}{\sqrt{2}}}$$

ex $$0.978436 = \frac{14\text{m}\hat{}2.5}{\frac{\left((3.33\text{m})^{2.5}\right)}{\sqrt{2}}}$$

12) Side Slope of Section given Top Width for Triangle

Open Calculator

$$z_{Tri} = \frac{T_{Tri}}{2 \cdot d_{f(\Delta)}}$$

$$0.990992 = \frac{6.60001\text{m}}{2 \cdot 3.33\text{m}}$$

13) Side Slope of Section given Wetted Area

Open Calculator

$$z_{Tri} = \frac{A_{Tri}}{d_{f(\Delta)} \cdot d_{f(\Delta)}}$$

$$0.982063 = \frac{10.89\text{m}^2}{3.33\text{m} \cdot 3.33\text{m}}$$

14) Side Slope of Section given Wetted Perimeters

Open Calculator

$$z_{Tri} = \sqrt{\left(\left(\frac{P_{Tri}}{2 \cdot d_{f(\Delta)}}\right)^2\right) - 1}$$

$$0.981083 = \sqrt{\left(\left(\frac{9.33\text{m}}{2 \cdot 3.33\text{m}}\right)^2\right) - 1}$$

15) Top Width for Triangle

Open Calculator

$$T_{Tri} = 2 \cdot d_{f(\Delta)} \cdot z_{Tri}$$

$$6.5934\text{m} = 2 \cdot 3.33\text{m} \cdot 0.99$$

16) Wetted Area for Triangular

Open Calculator

fx $$A_{Tri} = z_{Tri} \cdot d_{f(\Delta)}^2$$

ex $$10.97801\text{m}^2 = 0.99 \cdot (3.33\text{m})^2$$

17) Wetted Perimeter for Triangular Section

Open Calculator

fx $$P_{Tri} = 2 \cdot d_{f(\Delta)} \cdot \left(\sqrt{z_{Tri} \cdot z_{Tri} + 1}\right)$$

ex $$9.371687\text{m} = 2 \cdot 3.33\text{m} \cdot \left(\sqrt{0.99 \cdot 0.99 + 1}\right)$$

Variables Used

- A_{Tri} Wetted Surface Area of Triangular Channel *(Square Meter)*
- $d_{f(\Delta)}$ Depth of Flow of Triangle Channel *(Meter)*
- $D_{H(\Delta)}$ Hydraulic Depth of Triangular Channel *(Meter)*
- P_{Tri} Wetted Perimeter of Triangular Channel *(Meter)*
- $R_{H(\Delta)}$ Hydraulic Radius of Triangular Channel *(Meter)*
- T_{Tri} Top Width of Triangular Channel *(Meter)*
- z_{Tri} Side Slope of Triangular Channel
- Z_{Δ} Section Factor of Triangular Channel *(Meter^2.5)*

Constants, Functions, Measurements used

- Function: **sqrt**, sqrt(Number)
  Square root function
- 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**
- **Geometrical Properties of Trapezoidal Channel Section Formulas**
- **Geometrical Properties of Triangular Channel Section Formulas**

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