Important Formulas of Cone PDF

Formulas
Examples
with Units

1) Base Circumference of Cone Formulas

1.1) Base Circumference of Cone Formula

Evaluate Formula

Formula

$$C_{Base} = 2 \cdot \pi \cdot r_{Base}$$

Example with Units

$$62.8319\,\text{m} = 2 \cdot 3.1416 \cdot 10\,\text{m}$$

1.2) Base Circumference of Cone given Base Area Formula

Evaluate Formula

Formula

$$C_{Base} = 2 \cdot \sqrt{\pi \cdot A_{Base}}$$

Example with Units

$$62.9159\,\text{m} = 2 \cdot \sqrt{3.1416 \cdot 315\,\text{m}^2}$$

1.3) Base Circumference of Cone given Lateral Surface Area and Slant Height Formula

Evaluate Formula

Formula

$$C_{Base} = 2 \cdot \frac{LSA}{h_{Slant}}$$

Example with Units

$$63.6364\,\text{m} = 2 \cdot \frac{350\,\text{m}^2}{11\,\text{m}}$$

1.4) Base Circumference of Cone given Volume Formula

Evaluate Formula

Formula

$$C_{Base} = 2 \cdot \pi \cdot \sqrt{\frac{3 \cdot V}{\pi \cdot h}}$$

Example with Units

$$62.6156\,\text{m} = 2 \cdot 3.1416 \cdot \sqrt{\frac{3 \cdot 520\,\text{m}^3}{3.1416 \cdot 5\,\text{m}}}$$

2) Base Radius of Cone Formulas

2.1) Base Radius of Cone given Base Area Formula

Evaluate Formula

Formula

$$r_{Base} = \sqrt{\frac{A_{Base}}{\pi}}$$

Example with Units

$$10.0134\,\text{m} = \sqrt{\frac{315\,\text{m}^2}{3.1416}}$$

2.2) Base Radius of Cone given Lateral Surface Area and Slant Height Formula 📲

Formula	Example with Units
$r_{Base} = \dfrac{LSA}{\pi \cdot h_{Slant}}$	$10.128\,m = \dfrac{350\,m^2}{3.1416 \cdot 11\,m}$

2.3) Base Radius of Cone given Total Surface Area and Slant Height Formula 📲

Formula

$$r_{Base} = \frac{1}{2} \cdot \left(\sqrt{h_{Slant}^2 + \frac{4 \cdot TSA}{\pi}} - h_{Slant} \right)$$

Example with Units

$$10.054\,m = \frac{1}{2} \cdot \left(\sqrt{11\,m^2 + \frac{4 \cdot 665\,m^2}{3.1416}} - 11\,m \right)$$

2.4) Base Radius of Cone given Volume Formula 📲

Formula	Example with Units
$r_{Base} = \sqrt{\dfrac{3 \cdot V}{\pi \cdot h}}$	$9.9656\,m = \sqrt{\dfrac{3 \cdot 520\,m^3}{3.1416 \cdot 5\,m}}$

3) Height of Cone Formulas 📲

3.1) Height of Cone given Lateral Surface Area Formula 📲

Formula	Example with Units
$h = \sqrt{\left(\dfrac{LSA}{\pi \cdot r_{Base}}\right)^2 - r_{Base}^2}$	$4.9111\,m = \sqrt{\left(\dfrac{350\,m^2}{3.1416 \cdot 10\,m}\right)^2 - 10\,m^2}$

3.2) Height of Cone given Total Surface Area Formula 📲

Formula	Example with Units
$h = \sqrt{\left(\dfrac{TSA}{\pi \cdot r_{Base}} - r_{Base}\right)^2 - r_{Base}^2}$	$4.9715\,m = \sqrt{\left(\dfrac{665\,m^2}{3.1416 \cdot 10\,m} - 10\,m\right)^2 - 10\,m^2}$

3.3) Height of Cone given Volume Formula 📲

Formula	Example with Units
$h = \dfrac{3 \cdot V}{\pi \cdot r_{Base}^2}$	$4.9656\,m = \dfrac{3 \cdot 520\,m^3}{3.1416 \cdot 10\,m^2}$

3.4) Height of Cone given Volume and Base Area Formula

Formula

$$h = \frac{3 \cdot V}{A_{Base}}$$

Example with Units

$$4.9524 \,\text{m} = \frac{3 \cdot 520 \,\text{m}^3}{315 \,\text{m}^2}$$

3.5) Height of Cone given Volume and Base Circumference Formula

Formula

$$h = \frac{12 \cdot \pi \cdot V}{C_{Base}^{\,2}}$$

Example with Units

$$5.4454 \,\text{m} = \frac{12 \cdot 3.1416 \cdot 520 \,\text{m}^3}{60 \,\text{m}^{\,2}}$$

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4) Slant Height of Cone Formulas

4.1) Slant Height of Cone Formula

Formula

$$h_{Slant} = \sqrt{h^2 + r_{Base}^{\,2}}$$

Example with Units

$$11.1803 \,\text{m} = \sqrt{5 \,\text{m}^2 + 10 \,\text{m}^{\,2}}$$

4.2) Slant Height of Cone given Lateral Surface Area Formula

Formula

$$h_{Slant} = \frac{LSA}{\pi \cdot r_{Base}}$$

Example with Units

$$11.1408 \,\text{m} = \frac{350 \,\text{m}^2}{3.1416 \cdot 10 \,\text{m}}$$

4.3) Slant Height of Cone given Total Surface Area Formula

Formula

$$h_{Slant} = \frac{TSA}{\pi \cdot r_{Base}} - r_{Base}$$

Example with Units

$$11.1676 \,\text{m} = \frac{665 \,\text{m}^2}{3.1416 \cdot 10 \,\text{m}} - 10 \,\text{m}$$

4.4) Slant Height of Cone given Volume Formula

Formula

$$h_{Slant} = \sqrt{\left(\frac{3 \cdot V}{\pi \cdot r_{Base}^{\,2}}\right)^2 + r_{Base}^{\,2}}$$

Example with Units

$$11.165 \,\text{m} = \sqrt{\left(\frac{3 \cdot 520 \,\text{m}^3}{3.1416 \cdot 10 \,\text{m}^{\,2}}\right)^2 + 10 \,\text{m}^{\,2}}$$

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5) Surface Area of Cone Formulas

5.1) Base Area of Cone Formula

Formula

$$A_{Base} = \pi \cdot r_{Base}^{\,2}$$

Example with Units

$$314.1593 \,\text{m}^2 = 3.1416 \cdot 10 \,\text{m}^{\,2}$$

5.2) Base Area of Cone given Lateral Surface Area and Slant Height Formula

Formula

$$A_{Base} = \pi \cdot \left(\frac{LSA}{\pi \cdot h_{Slant}} \right)^2$$

Example with Units

$$322.2559 \, m^2 = 3.1416 \cdot \left(\frac{350 \, m^2}{3.1416 \cdot 11 \, m} \right)^2$$

5.3) Lateral Surface Area of Cone Formula

Formula

$$LSA = \pi \cdot r_{Base} \cdot h_{Slant}$$

Example with Units

$$345.5752 \, m^2 = 3.1416 \cdot 10 \, m \cdot 11 \, m$$

5.4) Lateral Surface Area of Cone given Base Area and Slant Height Formula

Formula

$$LSA = \pi \cdot \sqrt{\frac{A_{Base}}{\pi}} \cdot h_{Slant}$$

Example with Units

$$346.0373 \, m^2 = 3.1416 \cdot \sqrt{\frac{315 \, m^2}{3.1416}} \cdot 11 \, m$$

5.5) Lateral Surface Area of Cone given Base Circumference and Slant Height Formula

Formula

$$LSA = \frac{C_{Base}}{2} \cdot h_{Slant}$$

Example with Units

$$330 \, m^2 = \frac{60 \, m}{2} \cdot 11 \, m$$

5.6) Lateral Surface Area of Cone given Height Formula

Formula

$$LSA = \pi \cdot r_{Base} \cdot \sqrt{h^2 + r_{Base}^2}$$

Example with Units

$$351.2407 \, m^2 = 3.1416 \cdot 10 \, m \cdot \sqrt{5 \, m^2 + 10 \, m^2}$$

5.7) Lateral Surface Area of Cone given Volume Formula

Formula

$$LSA = \pi \cdot r_{Base} \cdot \sqrt{\left(\frac{3 \cdot V}{\pi \cdot r_{Base}^2} \right)^2 + r_{Base}^2}$$

Example with Units

$$350.7592 \, m^2 = 3.1416 \cdot 10 \, m \cdot \sqrt{\left(\frac{3 \cdot 520 \, m^3}{3.1416 \cdot 10 \, m^2} \right)^2 + 10 \, m^2}$$

5.8) Total Surface Area of Cone Formula

Formula

$$TSA = \pi \cdot r_{Base} \cdot \left(r_{Base} + h_{Slant} \right)$$

Example with Units

$$659.7345 \, m^2 = 3.1416 \cdot 10 \, m \cdot \left(10 \, m + 11 \, m \right)$$

5.9) Total Surface Area of Cone given Base Area Formula ➤

Formula

$$TSA = \left(\pi \cdot r_{Base} \cdot h_{Slant} \right) + A_{Base}$$

Example with Units

$$660.5752 \, m^2 = \left(3.1416 \cdot 10 \, m \cdot 11 \, m \right) + 315 \, m^2$$

5.10) Total Surface Area of Cone given Lateral Surface Area Formula ➤

Formula

$$TSA = LSA + \left(\pi \cdot r_{Base}^{\,2} \right)$$

Example with Units

$$664.1593 \, m^2 = 350 \, m^2 + \left(3.1416 \cdot 10 \, m^2 \right)$$

5.11) Total Surface Area of Cone given Lateral Surface Area and Base Area Formula ➤

Formula

$$TSA = LSA + A_{Base}$$

Example with Units

$$665 \, m^2 = 350 \, m^2 + 315 \, m^2$$

6) Volume of Cone Formulas ➤

6.1) Volume of Cone Formula ➤

Formula

$$V = \frac{\pi \cdot r_{Base}^{\,2} \cdot h}{3}$$

Example with Units

$$523.5988 \, m^3 = \frac{3.1416 \cdot 10 \, m^2 \cdot 5 \, m}{3}$$

6.2) Volume of Cone given Base Circumference Formula ➤

Formula

$$V = \frac{C_{Base}^{\,2} \cdot h}{12 \cdot \pi}$$

Example with Units

$$477.4648 \, m^3 = \frac{60 \, m^2 \cdot 5 \, m}{12 \cdot 3.1416}$$

6.3) Volume of Cone given Lateral Surface Area Formula ➤

Formula

$$V = \frac{\pi \cdot r_{Base}^{\,2} \cdot \sqrt{\left(\frac{LSA}{\pi \cdot r_{Base}} \right)^2 - r_{Base}^{\,2}}}{3}$$

Example with Units

$$514.2844 \, m^3 = \frac{3.1416 \cdot 10 \, m^2 \cdot \sqrt{\left(\frac{350 \, m^2}{3.1416 \cdot 10 \, m} \right)^2 - 10 \, m^2}}{3}$$

6.4) Volume of Cone given Slant Height and Height Formula ⤴

Formula

$$V = \frac{\pi \cdot \left(h_{Slant}^{2} - h^{2} \right) \cdot h}{3}$$

Example with Units

$$502.6548 \, m^3 = \frac{3.1416 \cdot \left(11 \, m^{2} - 5 \, m^{2} \right) \cdot 5 \, m}{3}$$

6.5) Volume of Cone given Total Surface Area Formula ⤴

Formula

$$V = \frac{\pi \cdot r_{Base}^{2} \cdot \sqrt{\left(\frac{TSA}{\pi \cdot r_{Base}} - r_{Base} \right)^{2} - r_{Base}^{2}}}{3}$$

Example with Units

$$520.6105 \, m^3 = \frac{3.1416 \cdot 10 \, m^{2} \cdot \sqrt{\left(\frac{665 \, m^{2}}{3.1416 \cdot 10 \, m} - 10 \, m \right)^{2} - 10 \, m^{2}}}{3}$$

Variables used in list of Important Formulas of Cone above

- A_{Base} Base Area of Cone *(Square Meter)*
- C_{Base} Base Circumference of Cone *(Meter)*
- h Height of Cone *(Meter)*
- h_{Slant} Slant Height of Cone *(Meter)*
- LSA Lateral Surface Area of Cone *(Square Meter)*
- r_{Base} Base Radius of Cone *(Meter)*
- TSA Total Surface Area of Cone *(Square Meter)*
- V Volume of Cone *(Cubic Meter)*

Constants, Functions, Measurements used in list of Important Formulas of Cone above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- 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: **Volume** in Cubic Meter (m³) *Volume Unit Conversion* 📤
- Measurement: **Area** in Square Meter (m²) *Area Unit Conversion* 📤

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