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# Pyramids Formulas

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## List of 18 Pyramids Formulas

Pyramids Hexagonal Pyramid 1) Base Area of Hexagonal Pyramid 

$$\text{fx } A_{\text{Base(Hexagon)}} = \frac{3 \cdot \sqrt{3}}{2} \cdot l_{\text{e(Base)Hexagon}}^2$$

Open Calculator 

$$\text{ex } 259.8076\text{m}^2 = \frac{3 \cdot \sqrt{3}}{2} \cdot (10\text{m})^2$$

2) Lateral Surface Area of Hexagonal Pyramid 

$$\text{fx } \text{LSA}_{\text{Hexagon}} = 3 \cdot h_{\text{slant(Hexagon)}} \cdot l_{\text{e(Base)Hexagon}}$$

Open Calculator 

$$\text{ex } 510\text{m}^2 = 3 \cdot 17\text{m} \cdot 10\text{m}$$

3) Total Surface Area of Hexagonal Pyramid 

$$\text{fx } \text{TSA}_{\text{Hexagon}} = (3 \cdot h_{\text{slant(Hexagon)}} \cdot l_{\text{e(Base)Hexagon}}) + \left( \frac{3 \cdot \sqrt{3}}{2} \cdot l_{\text{e(Base)Hexagon}}^2 \right)$$

Open Calculator 

$$\text{ex } 769.8076\text{m}^2 = (3 \cdot 17\text{m} \cdot 10\text{m}) + \left( \frac{3 \cdot \sqrt{3}}{2} \cdot (10\text{m})^2 \right)$$

4) Volume of Hexagonal Pyramid 

$$\text{fx } V_{\text{Hexagon}} = \frac{\sqrt{3}}{2} \cdot l_{\text{e(Base)Hexagon}}^2 \cdot h_{\text{Hexagon}}$$

Open Calculator 

$$\text{ex } 1299.038\text{m}^3 = \frac{\sqrt{3}}{2} \cdot (10\text{m})^2 \cdot 15\text{m}$$



## Pentagonal Pyramid

### 5) Base Area of Pentagonal Pyramid

$$\text{fx } A_{\text{Base(Pentagon)}} = \frac{1}{4} \cdot \sqrt{5 \cdot \left(5 + \left(2 \cdot \sqrt{5}\right)\right)} \cdot l_{\text{e(Base)Pentagon}}^2$$

[Open Calculator !\[\]\(a03a7eb2f4046e1d3c76772003e549ea\_img.jpg\)](#)

$$\text{ex } 172.0477\text{m}^2 = \frac{1}{4} \cdot \sqrt{5 \cdot \left(5 + \left(2 \cdot \sqrt{5}\right)\right)} \cdot (10\text{m})^2$$

### 6) Lateral Surface Area of Pentagonal Pyramid

$$\text{fx } \text{LSA}_{\text{Pentagon}} = \frac{5}{2} \cdot l_{\text{e(Base)Pentagon}} \cdot h_{\text{slant(Pentagon)}}$$

[Open Calculator !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc\_img.jpg\)](#)

$$\text{ex } 425\text{m}^2 = \frac{5}{2} \cdot 10\text{m} \cdot 17\text{m}$$

### 7) Total Surface Area of Pentagonal Pyramid

$$\text{fx } \text{TSA}_{\text{Pentagon}} = \left(\frac{5}{2} \cdot l_{\text{e(Base)Pentagon}} \cdot h_{\text{slant(Pentagon)}}\right) + \left(\frac{5}{4} \cdot \tan\left(54 \cdot \frac{\pi}{180}\right) \cdot l_{\text{e(Base)Pentagon}}^2\right)$$

[Open Calculator !\[\]\(b792654f2cef9719eabeb6c5be00811e\_img.jpg\)](#)

$$\text{ex } 597.0477\text{m}^2 = \left(\frac{5}{2} \cdot 10\text{m} \cdot 17\text{m}\right) + \left(\frac{5}{4} \cdot \tan\left(54 \cdot \frac{\pi}{180}\right) \cdot (10\text{m})^2\right)$$

### 8) Volume of Pentagonal Pyramid

$$\text{fx } V_{\text{Pentagon}} = \frac{5}{12} \cdot \tan\left(54 \cdot \frac{\pi}{180}\right) \cdot h_{\text{Pentagon}} \cdot l_{\text{e(Base)Pentagon}}^2$$

[Open Calculator !\[\]\(84f47badaad7772cd95667a7c387a639\_img.jpg\)](#)

$$\text{ex } 860.2387\text{m}^3 = \frac{5}{12} \cdot \tan\left(54 \cdot \frac{\pi}{180}\right) \cdot 15\text{m} \cdot (10\text{m})^2$$

## Regular Pyramid

### 9) Base Area of Pyramid

$$\text{fx } A_{\text{Base}} = l_{\text{e(Base)}}^2$$

[Open Calculator !\[\]\(1ed10657a19f9137278430c48fd18626\_img.jpg\)](#)

$$\text{ex } 100\text{m}^2 = (10\text{m})^2$$



10) Lateral Surface Area of Pyramid 

$$\text{fx } \text{LSA} = l_{e(\text{Base})} \cdot \sqrt{(4 \cdot h^2) + l_{e(\text{Base})}^2}$$

Open Calculator 

$$\text{ex } 316.2278\text{m}^2 = 10\text{m} \cdot \sqrt{(4 \cdot (15\text{m})^2) + (10\text{m})^2}$$

11) Total Surface Area of Pyramid 

$$\text{fx } \text{TSA} = l_{e(\text{Base})}^2 + \left( l_{e(\text{Base})} \cdot \sqrt{(4 \cdot h^2) + l_{e(\text{Base})}^2} \right)$$

Open Calculator 


$$\text{ex } 416.2278\text{m}^2 = (10\text{m})^2 + \left( 10\text{m} \cdot \sqrt{(4 \cdot (15\text{m})^2) + (10\text{m})^2} \right)$$

12) Volume of Pyramid 

$$\text{fx } V = \frac{l_{e(\text{Base})}^2 \cdot h}{3}$$

Open Calculator 

$$\text{ex } 500\text{m}^3 = \frac{(10\text{m})^2 \cdot 15\text{m}}{3}$$

Truncated Pyramid 13) Base Area of Truncated Pyramid 

$$\text{fx } A_{\text{Base(Truncated)}} = \text{TSA}_{\text{Truncated}} - (\text{LSA}_{\text{Truncated}} + A_{\text{Top}})$$

Open Calculator 

$$\text{ex } 100\text{m}^2 = 575\text{m}^2 - (450\text{m}^2 + 25\text{m}^2)$$

14) Height of Truncated Pyramid 

$$\text{fx } h_{\text{Truncated}} = \frac{3 \cdot V_{\text{Truncated}}}{A_{\text{Base(Truncated)}} + \sqrt{A_{\text{Top}} \cdot A_{\text{Base(Truncated)}}} + A_{\text{Top}}}$$

Open Calculator 

$$\text{ex } 15\text{m} = \frac{3 \cdot 875\text{m}^3}{100\text{m}^2 + \sqrt{25\text{m}^2 \cdot 100\text{m}^2} + 25\text{m}^2}$$



15) Lateral Surface Area of Truncated Pyramid 

fx

Open Calculator 

$$LSA_{\text{Truncated}} = 2 \cdot \left( \sqrt{A_{\text{Base(Truncated)}}} + \sqrt{A_{\text{Top}}} \right) \cdot \sqrt{\left( \frac{\sqrt{A_{\text{Base(Truncated)}}} - \sqrt{A_{\text{Top}}}}{2} \right)^2 + h^2}$$


$$\text{ex } 456.2072\text{m}^2 = 2 \cdot \left( \sqrt{100\text{m}^2} + \sqrt{25\text{m}^2} \right) \cdot \sqrt{\left( \frac{\sqrt{100\text{m}^2} - \sqrt{25\text{m}^2}}{2} \right)^2 + (15\text{m})^2}$$

16) Top Area of Truncated Pyramid 

$$\text{fx } A_{\text{Top}} = TSA_{\text{Truncated}} - (A_{\text{Base(Truncated)}} + LSA_{\text{Truncated}})$$

Open Calculator 


$$\text{ex } 25\text{m}^2 = 575\text{m}^2 - (100\text{m}^2 + 450\text{m}^2)$$

17) Total Surface Area of Truncated Pyramid 


$$\text{fx } TSA_{\text{Truncated}} = LSA_{\text{Truncated}} + A_{\text{Top}} + A_{\text{Base(Truncated)}}$$

Open Calculator 

$$\text{ex } 575\text{m}^2 = 450\text{m}^2 + 25\text{m}^2 + 100\text{m}^2$$

18) Volume of Truncated Pyramid 

fx

Open Calculator 

$$V_{\text{Truncated}} = \frac{1}{3} \cdot h_{\text{Truncated}} \cdot \left( A_{\text{Base(Truncated)}} + \sqrt{A_{\text{Top}} \cdot A_{\text{Base(Truncated)}}} + A_{\text{Top}} \right)$$

$$\text{ex } 875\text{m}^3 = \frac{1}{3} \cdot 15\text{m} \cdot \left( 100\text{m}^2 + \sqrt{25\text{m}^2 \cdot 100\text{m}^2} + 25\text{m}^2 \right)$$






## Variables Used

- **A<sub>Base</sub>** Base Area of Pyramid (Square Meter)
- **A<sub>Base(Hexagon)</sub>** Base Area of Hexagonal Pyramid (Square Meter)
- **A<sub>Base(Pentagon)</sub>** Base Area of Pentagonal Pyramid (Square Meter)
- **A<sub>Base(Truncated)</sub>** Base Area of Truncated Pyramid (Square Meter)
- **A<sub>Top</sub>** Top Area of Truncated Pyramid (Square Meter)
- **h** Height of Pyramid (Meter)
- **h<sub>Hexagon</sub>** Height of Hexagonal Pyramid (Meter)
- **h<sub>Pentagon</sub>** Height of Pentagonal Pyramid (Meter)
- **h<sub>slant(Hexagon)</sub>** Slant Height of Hexagonal Pyramid (Meter)
- **h<sub>slant(Pentagon)</sub>** Slant Height of Pentagonal Pyramid (Meter)
- **h<sub>Truncated</sub>** Height of Truncated Pyramid (Meter)
- **l<sub>e(Base)</sub>** Edge Length of Base of Pyramid (Meter)
- **l<sub>e(Base)Hexagon</sub>** Edge Length of Base of Hexagonal Pyramid (Meter)
- **l<sub>e(Base)Pentagon</sub>** Edge Length of Base of Pentagonal Pyramid (Meter)
- **LSA** Lateral Surface Area of Pyramid (Square Meter)
- **LSA<sub>Hexagon</sub>** Lateral Surface Area of Hexagonal Pyramid (Square Meter)
- **LSA<sub>Pentagon</sub>** Lateral Surface Area of Pentagonal Pyramid (Square Meter)
- **LSA<sub>Truncated</sub>** Lateral Surface Area of Truncated Pyramid (Square Meter)
- **TSA** Total Surface Area of Pyramid (Square Meter)
- **TSA<sub>Hexagon</sub>** Total Surface Area of Hexagonal Pyramid (Square Meter)
- **TSA<sub>Pentagon</sub>** Total Surface Area of Pentagonal Pyramid (Square Meter)
- **TSA<sub>Truncated</sub>** Total Surface Area of Truncated Pyramid (Square Meter)
- **V** Volume of Pyramid (Cubic Meter)
- **V<sub>Hexagon</sub>** Volume of Hexagonal Pyramid (Cubic Meter)
- **V<sub>Pentagon</sub>** Volume of Pentagonal Pyramid (Cubic Meter)
- **V<sub>Truncated</sub>** Volume of Truncated Pyramid (Cubic Meter)



## Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288  
*Archimedes' constant*
- **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:** **Volume** in Cubic Meter (m<sup>3</sup>)  
*Volume Unit Conversion* 
- **Measurement:** **Area** in Square Meter (m<sup>2</sup>)  
*Area Unit Conversion* 



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