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Rhombicosidodecahedron Formulas

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List of 30 Rhombicosidodecahedron Formulas

Rhombicosidodecahedron

Edge Length of Rhombicosidodecahedron

1) Edge Length of Rhombicosidodecahedron given Circumsphere Radius

Open Calculator

fx $$l_e = \frac{2 \cdot r_c}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}$$

ex $$9.852435\text{m} = \frac{2 \cdot 22\text{m}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}$$

2) Edge Length of Rhombicosidodecahedron given Midsphere Radius

Open Calculator

fx $$l_e = \frac{2 \cdot r_m}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}$$

ex $$9.649623\text{m} = \frac{2 \cdot 21\text{m}}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}$$

3) Edge Length of Rhombicosidodecahedron given Surface to Volume Ratio

Open Calculator

fx $$l_e = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{R_{A/V} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$14.251\text{m} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{0.1\text{m}^{-1} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

4) Edge Length of Rhombicosidodecahedron given Total Surface Area

Open Calculator

fx $$l_e = \sqrt{\frac{TSA}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

ex $$9.97417\text{m} = \sqrt{\frac{5900\text{m}^2}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

5) Edge Length of Rhombicosidodecahedron given Volume

Open Calculator

fx $$l_e = \left(\frac{3 \cdot V}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}}$$

ex $$10.03072\text{m} = \left(\frac{3 \cdot 42000\text{m}^3}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}}$$

Radius of Rhombicosidodecahedron

Circumsphere Radius of Rhombicosidodecahedron

6) Circumsphere Radius of Rhombicosidodecahedron

Open Calculator

fx $$r_c = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot l_e$$

ex $$22.32951\text{m} = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot 10\text{m}$$

7) Circumsphere Radius of Rhombicosidodecahedron given Midsphere Radius

Open Calculator

$$r_c = \sqrt{11 + \left(4 \cdot \sqrt{5}\right)} \cdot \frac{r_m}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}$$

$$21.54713\text{m} = \sqrt{11 + \left(4 \cdot \sqrt{5}\right)} \cdot \frac{21\text{m}}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}$$

8) Circumsphere Radius of Rhombicosidodecahedron given Surface to Volume Ratio

Open Calculator

$$r_c = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{R_{A/V} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

$$31.82177\text{m} = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{0.1\text{m}^{-1} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

9) Circumsphere Radius of Rhombicosidodecahedron given Total Surface Area

Open Calculator

$$r_c = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \sqrt{\frac{TSA}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

$$22.27183\text{m} = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \sqrt{\frac{5900\text{m}^2}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

10) Circumsphere Radius of Rhombicosidodecahedron given Volume

Open Calculator

fx $$r_c = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \left(\frac{3 \cdot V}{60 + \left(29 \cdot \sqrt{5}\right)} \right)^{\frac{1}{3}}$$

ex $$22.3981\text{m} = \frac{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \left(\frac{3 \cdot 42000\text{m}^3}{60 + \left(29 \cdot \sqrt{5}\right)} \right)^{\frac{1}{3}}$$

Midsphere Radius of Rhombicosidodecahedron

11) Midsphere Radius of Rhombicosidodecahedron

Open Calculator

fx $$r_m = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot l_e$$

ex $$21.76251\text{m} = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot 10\text{m}$$

12) Midsphere Radius of Rhombicosidodecahedron given Circumsphere Radius

Open Calculator

fx $$r_m = \sqrt{10 + \left(4 \cdot \sqrt{5}\right)} \cdot \frac{r_c}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}$$

ex $$21.44137\text{m} = \sqrt{10 + \left(4 \cdot \sqrt{5}\right)} \cdot \frac{22\text{m}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}$$

13) Midsphere Radius of Rhombicosidodecahedron given Surface to Volume Ratio

Open Calculator

fx $$r_m = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{R_{A/V} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$31.01374\text{m} = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{0.1\text{m}^{-1} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

14) Midsphere Radius of Rhombicosidodecahedron given Total Surface Area

Open Calculator

fx $$r_m = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \sqrt{\frac{TSA}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

ex $$21.7063\text{m} = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \sqrt{\frac{5900\text{m}^2}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}}$$

15) Midsphere Radius of Rhombicosidodecahedron given Volume

Open Calculator

fx $$r_m = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \left(\frac{3 \cdot V}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}}$$

ex $$21.82936\text{m} = \frac{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}{2} \cdot \left(\frac{3 \cdot 42000\text{m}^3}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}}$$

Surface Area of Rhombicosidodecahedron

Total Surface Area of Rhombicosidodecahedron

16) Total Surface Area of Rhombicosidodecahedron

Open Calculator

fx $$TSA = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot l_e^2$$

ex $$5930.598\text{m}^2 = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot (10\text{m})^2$$

17) Total Surface Area of Rhombicosidodecahedron given Circumsphere Radius

Open Calculator

$$\text{TSA} = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{2 \cdot r_c}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}\right)^2$$

ex $$5756.86\text{m}^2 = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{2 \cdot 22\text{m}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}\right)^2$$

18) Total Surface Area of Rhombicosidodecahedron given Midsphere Radius

Open Calculator

$$\text{TSA} = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{2 \cdot r_m}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}\right)^2$$

ex $$5522.289\text{m}^2 = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{2 \cdot 21\text{m}}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}\right)^2$$

19) Total Surface Area of Rhombicosidodecahedron given Surface to Volume Ratio

Open Calculator

$$\text{TSA} = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 +\right.\right.\right.}\right.}{R_{A/V} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right.}$$

ex $$12044.51\text{m}^2 = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right.\right.\right.}{0.1\text{m}^{-1} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

20) Total Surface Area of Rhombicosidodecahedron given Volume

Open Calculator

fx $$\mathrm{TSA} = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{3 \cdot \mathrm{V}}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{2}{3}}$$

ex $$5967.089\mathrm{m}^2 = \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right) \cdot \left(\frac{3 \cdot 42000\mathrm{m}^3}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{2}{3}}$$

Surface to Volume Ratio of Rhombicosidodecahedron

21) Surface to Volume Ratio of Rhombicosidodecahedron

Open Calculator

fx $$\mathrm{R_{A/V}} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\mathrm{l_e} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$0.14251\mathrm{m}^{-1} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{10\mathrm{m} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

22) Surface to Volume Ratio of Rhombicosidodecahedron given Circumsphere Radius

Open Calculator

fx $$\mathrm{R_{A/V}} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\frac{2 \cdot \mathrm{r_c}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$0.144644\mathrm{m}^{-1} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\frac{2 \cdot 22\mathrm{m}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

23) Surface to Volume Ratio of Rhombicosidodecahedron given Midsphere Radius

Open Calculator

fx $$R_{A/V} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\frac{2 \cdot r_m}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$0.147684\text{m}^{-1} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\frac{2 \cdot 21\text{m}}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

24) Surface to Volume Ratio of Rhombicosidodecahedron given Total Surface Area

Open Calculator

fx $$R_{A/V} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\sqrt{\frac{TSA}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$0.142879\text{m}^{-1} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\sqrt{\frac{5900\text{m}^2}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

25) Surface to Volume Ratio of Rhombicosidodecahedron given Volume

Open Calculator

fx $$R_{A/V} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\left(\frac{3 \cdot V}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

ex $$0.142074\text{m}^{-1} = \frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{\left(\frac{3 \cdot 42000\text{m}^3}{60 + \left(29 \cdot \sqrt{5}\right)}\right)^{\frac{1}{3}} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)}$$

Volume of Rhombicosidodecahedron

26) Volume of Rhombicosidodecahedron

Open Calculator

fx $$V = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot l_e^3$$

ex $$41615.32\text{m}^3 = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot (10\text{m})^3$$

27) Volume of Rhombicosidodecahedron given Circumsphere Radius

Open Calculator

fx $$V = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{2 \cdot r_c}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}\right)^3$$

ex $$39800.09\text{m}^3 = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{2 \cdot 22\text{m}}{\sqrt{11 + \left(4 \cdot \sqrt{5}\right)}}\right)^3$$

28) Volume of Rhombicosidodecahedron given Midsphere Radius

Open Calculator

fx $$V = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{2 \cdot r_m}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}\right)^3$$

ex $$37392.48\text{m}^3 = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{2 \cdot 21\text{m}}{\sqrt{10 + \left(4 \cdot \sqrt{5}\right)}}\right)^3$$

29) Volume of Rhombicosidodecahedron given Surface to Volume Ratio

Open Calculator

$$V = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{R_{A/V} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)} \right)^3$$

ex $$120445.1\text{m}^3 = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\frac{3 \cdot \left(30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)\right)}{0.1\text{m}^{-1} \cdot \left(60 + \left(29 \cdot \sqrt{5}\right)\right)} \right)^3$$

30) Volume of Rhombicosidodecahedron given Total Surface Area

Open Calculator

$$V = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\sqrt{\frac{TSA}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}} \right)^3$$

ex $$41293.67\text{m}^3 = \frac{60 + \left(29 \cdot \sqrt{5}\right)}{3} \cdot \left(\sqrt{\frac{5900\text{m}^2}{30 + \left(5 \cdot \sqrt{3}\right) + \left(3 \cdot \sqrt{25 + \left(10 \cdot \sqrt{5}\right)}\right)}} \right)^3$$

Variables Used

- l_e Edge Length of Rhombicosidodecahedron *(Meter)*
- $R_{A/V}$ Surface to Volume Ratio of Rhombicosidodecahedron *(1 per Meter)*
- r_c Circumsphere Radius of Rhombicosidodecahedron *(Meter)*
- r_m Midsphere Radius of Rhombicosidodecahedron *(Meter)*
- **TSA** Total Surface Area of Rhombicosidodecahedron *(Square Meter)*
- **V** Volume of Rhombicosidodecahedron *(Cubic Meter)*

Constants, Functions, Measurements used

- Function: **sqrt**, sqrt(Number)
  Square root function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Volume** in Cubic Meter (m^3)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion
- Measurement: **Reciprocal Length** in 1 per Meter (m^{-1})
  Reciprocal Length Unit Conversion

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