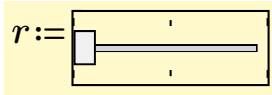


# Prime 10



$r = 1$

- PlatonicSolids :=
- Tetrahedron
  - Hexahedron
  - Octahedron
  - Dodecahedron
  - Icosahedron

Paint :=  Fill the Surfaces

Circle :=  Plot the Circle

Radius :=  Plot the Lines

PlatonicSolids = 1

$l = \text{length\_of\_one\_side}$ , when the **circumscribed circle** of one area has a **radius r**.

$l = 1.732$

Faces = 4

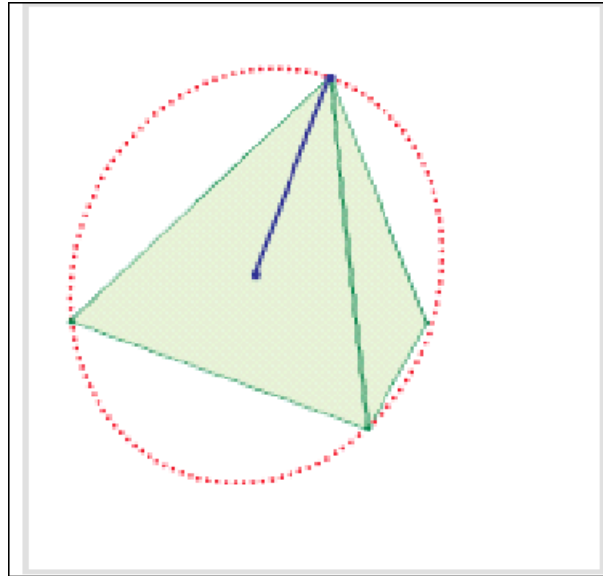
Edges = 6

Vertices = 4

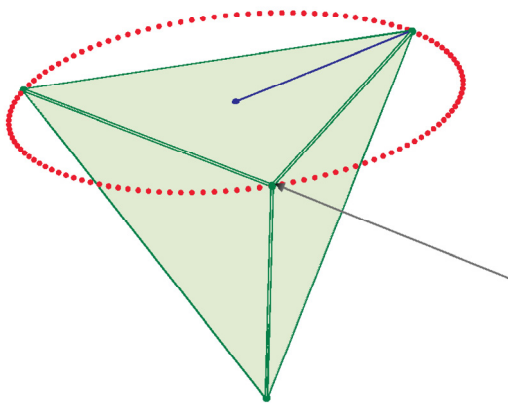
EulerC = 2

Area(l) = 5.196

Volume(l) = 0.612



Paint = 1     $r \rightarrow 1$      $l \rightarrow \sqrt{3}$      $O \rightarrow [0 \ 0 \ 0]$



$$S_1 \rightarrow \frac{3 \cdot \sqrt{3}}{4}$$

$$S_{all} := 4 \cdot S_1 \rightarrow 3 \cdot \sqrt{3}$$

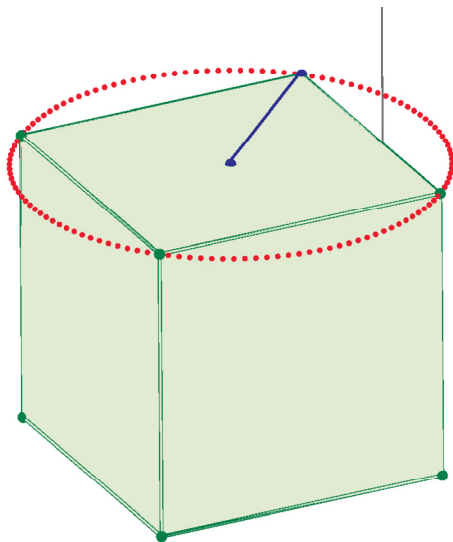
$$S_4 := \sqrt{3} \cdot l^2 \rightarrow 3 \cdot \sqrt{3}$$

$$\frac{S_1 \cdot \text{Dist}(O, o_{abc})}{3} \cdot 4 \rightarrow \frac{\sqrt{2} \cdot \sqrt{3}}{4}$$

$$V_4 := \frac{\sqrt{2}}{12} \cdot l^3 \rightarrow \frac{\sqrt{2} \cdot \sqrt{3}}{4}$$

## Prime 10

$$r=1 \quad l \rightarrow \sqrt{2}$$



$$O \rightarrow [0 \ 0 \ 0] \quad l := \text{Dist}(a, b) \rightarrow \sqrt{2}$$

$$S_1 \rightarrow 2$$

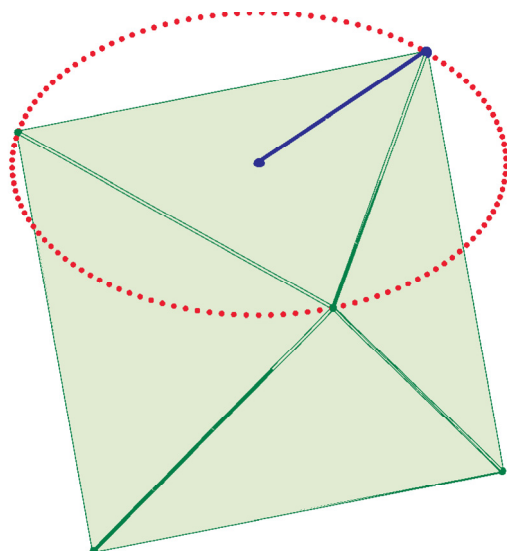
$$S_{all} := 6 \cdot S_1 \rightarrow 12$$

$$S_6 := 6 \cdot l^2 \rightarrow 12$$

$$\frac{S_1 \cdot \text{Dist}(O, o_{abcd})}{3} \cdot 6 \rightarrow 2 \cdot \sqrt{2}$$

$$V_6 := l^3 \rightarrow 2 \cdot \sqrt{2}$$

$$r=1 \quad l \rightarrow \sqrt{3}$$



$$O \rightarrow [0 \ 0 \ 0] \quad l := \text{Dist}(a, b) \rightarrow \sqrt{3}$$

$$S_1 := l^2 \cdot \frac{\sqrt{3}}{4} \rightarrow \frac{3 \cdot \sqrt{3}}{4}$$

$$S_{all} := 8 \cdot S_1 \rightarrow 6 \cdot \sqrt{3}$$

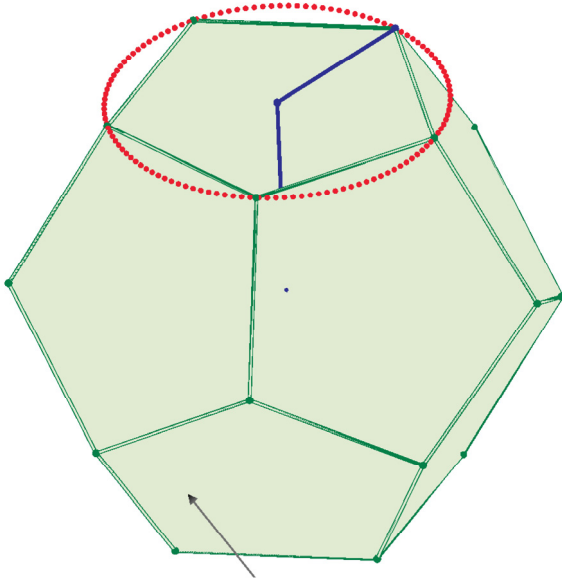
$$S_8 := 2 \cdot \sqrt{3} \cdot l^2 \rightarrow 6 \cdot \sqrt{3}$$

$$\frac{S_1 \cdot \text{Dist}(O, o_{abc})}{3} \cdot 8 \xrightarrow{\text{simplify}} \sqrt{6}$$

$$V_8 := \frac{\sqrt{2}}{3} \cdot l^3 \xrightarrow{\text{simplify}} \sqrt{6}$$

# Prime 10

$r=1$       $l \rightarrow \sqrt{\frac{2}{9 \cdot \sqrt{5} + 21}} + \frac{4}{3} = 1.176$



$O \rightarrow [0 \ 0 \ 0]$

$$S_1 := \frac{r_{12}^2 \cdot \sin\left(\frac{2 \cdot \pi}{5}\right)}{2} \cdot 5 \xrightarrow{\text{simplify}} \frac{5 \cdot \sqrt{2 \cdot \sqrt{5} + 10}}{8}$$

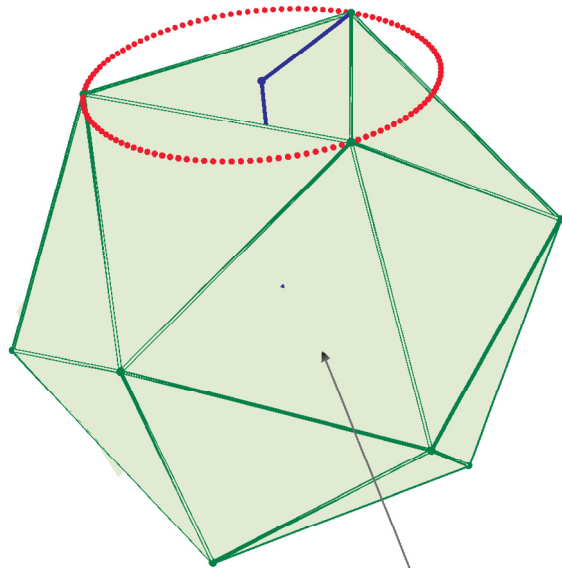
$$S_{all} := S_1 \cdot 12 \rightarrow \frac{15 \cdot \sqrt{2} \cdot \sqrt{\sqrt{5} + 5}}{2} = 28.532$$

$$S_{12} := 3 \cdot \sqrt{25 + 10 \cdot \sqrt{5}} \cdot l^2 \xrightarrow{\text{simplify}} \frac{30 \cdot \sqrt{2 \cdot \sqrt{5} + 5} \cdot (\sqrt{5} + 2)}{3 \cdot \sqrt{5} + 7} = 28.532$$

$$\frac{S_1 \cdot \text{Dist}(O, o_5)}{3} \cdot 12 \xrightarrow{\text{simplify}} \frac{5 \cdot \sqrt{-\frac{22}{\sqrt{5} + 3}} + 29}{2} = 12.449$$

$$V_{12} := \frac{15 + 7 \cdot \sqrt{5}}{4} \cdot l^3 \xrightarrow{\text{simplify}} \frac{(65 \cdot \sqrt{5} + 145) \cdot \sqrt{\frac{4 \cdot \sqrt{5} + 10}{3 \cdot \sqrt{5} + 7}}}{6 \cdot \sqrt{5} + 14} = 12.449$$

$r=1$       $l \rightarrow \sqrt{3}$



$O \rightarrow [0 \ 0 \ 0]$

$l := \text{Dist}(a, b) \xrightarrow{\text{simplify}} \sqrt{3}$

$$r_{oa} := \text{Dist}(a, o_{abc}) \xrightarrow{\text{simplify}} 1$$

$$S_1 := l^2 \cdot \frac{\sqrt{3}}{4} \rightarrow \frac{3 \cdot \sqrt{3}}{4}$$

$$S_{all} := S_1 \cdot 20 \rightarrow 15 \cdot \sqrt{3}$$

$$S_{20} := 5 \cdot \sqrt{3} \cdot l^2 \xrightarrow{\text{simplify}} 15 \cdot \sqrt{3}$$

$$\frac{S_1 \cdot \text{Dist}(O, o_{abc})}{3} \cdot 20 \xrightarrow{\text{simplify}} \frac{5 \cdot \sqrt{162 \cdot \sqrt{5} + 378}}{12} = 11.336$$

$$V_{20} := \frac{5 \cdot (3 + \sqrt{5})}{12} \cdot l^3 \xrightarrow{\text{simplify}} \frac{5 \cdot \sqrt{15} + 15 \cdot \sqrt{3}}{4} = 11.336$$

# Prime 10

$$Ans_{r1} := \begin{bmatrix} 4 & S_4 & V_4 & R_4 & \frac{1}{2} \\ 6 & S_6 & V_6 & R_6 & \frac{7}{12} \\ 8 & S_8 & V_8 & R_8 & \frac{5}{12} \\ 12 & S_{12} & V_{12} & R_{12} & \frac{19}{30} \\ 20 & S_{20} & V_{20} & R_{20} & \frac{11}{30} \end{bmatrix}$$

$$G := Grid \left( \begin{bmatrix} 4 \\ 20 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 30 \\ 2.5 \end{bmatrix} \right)$$

$$n := Ans_{r1}^{(0)} \quad S_{r=1} := Ans_{r1}^{(1)} \quad V_{r=1} := Ans_{r1}^{(2)}$$

$$R_{pp} := Ans_{r1}^{(3)} \quad R_{12} := Ans_{r1}^{(4)}$$

