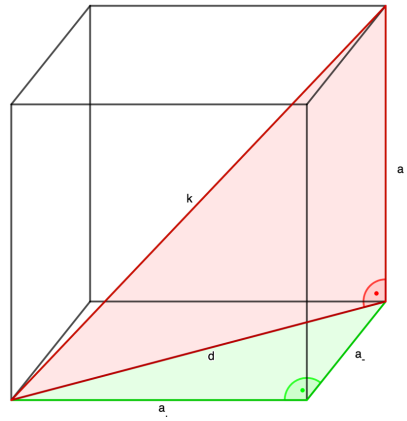
Pythagoras im Raum: Beispiel: Raumdiagonale eines Quaders

Berechne die Raumdiagonale dieses Würfels:

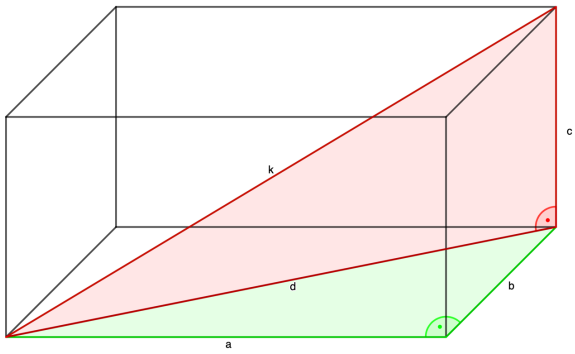


$$d = \sqrt{a^2 + a^2} = \sqrt{2a^2} = \underline{a\sqrt{2}}$$

$$k = \sqrt{d^2 + a^2} = \sqrt{2a^2 + a^2} = \sqrt{3a^2}$$

$$\underline{\underline{k = a\sqrt{3}}}$$

Berechne die Raumdiagonale dieses Quaders:



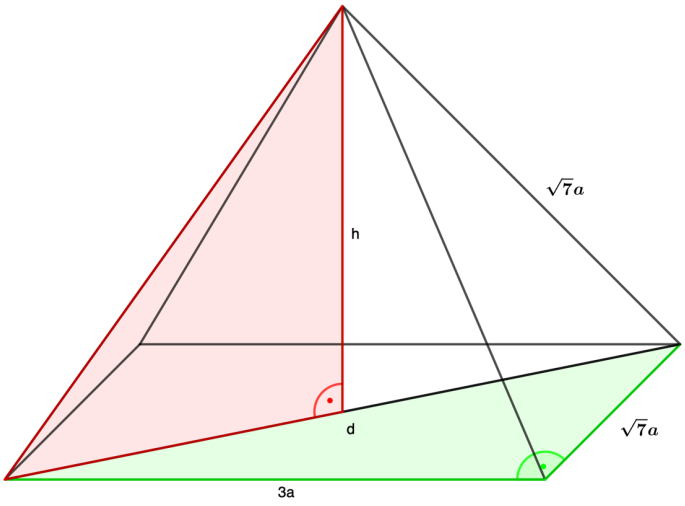
$$\underline{d = \sqrt{a^2 + b^2}}$$

$$k = \sqrt{d^2 + c^2}$$

$$\underline{\underline{k = \sqrt{a^2 + b^2 + c^2}}}$$

Pythagoras mit Variablen

Berechne die Höhe dieser Pyramide:



$$d = \sqrt{(3a)^2 + \left(\sqrt{7}a\right)^2}$$

$$d = \sqrt{9a^2 + 7a^2} = \sqrt{16a^2} = \underline{4a}$$

$$h = \sqrt{\left(\sqrt{7}a\right)^2 - \left(\frac{d}{2}\right)^2} \qquad \left[\frac{d}{2} = 2a\right]$$

$$h = \sqrt{7a^2 - 4a^2} = \sqrt{3a^2}$$

$$\underline{\underline{h = a\sqrt{3}}}$$