

# Wiskunde – Machten, vierkantswortels en machtswortels

## 1. Machten

### Definitie

$$\forall a \in \mathbb{R} \text{ en } \forall n \in \mathbb{N} \setminus \{0,1\}$$

$$a^n = \underbrace{a \cdot a \cdot \dots \cdot a}_n$$

$$a^1 = a$$

$$a^0 = 1$$

### Eigenschappen

$$\forall a, b \in \mathbb{R}_0 \text{ en } \forall m, n \in \mathbb{Z}$$

$$a^m \cdot a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = (a^n)^m = a^{m \cdot n}$$

$$(a^m)^{\frac{1}{n}} = (a^{\frac{1}{n}})^m = a^{\frac{m}{n}}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$(a \cdot b)^n = a^n \cdot b^n$$

## 2. Vierkantswortels

### Definitie

$$\forall a, b \in \mathbb{R}^+$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$\sqrt{a} = b \iff a = b^2$$

### Eigenschappen

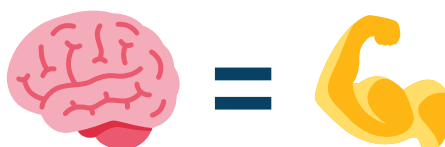
$$\forall a, b \in \mathbb{R}^+ \text{ en } \forall n \in \mathbb{Z}$$

$$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$

$$\sqrt{a^{2n}} = a^n$$

$$(\sqrt{a})^n = \sqrt{a^n}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$



### 3. Machtswortels

#### Definitie

$$\forall a, b \in \mathbb{R} \text{ en } \forall n \in \mathbb{N}_0$$

#### Eigenschappen

$$\forall a, b \in \mathbb{R}^+ \text{ en } \forall m, n, p \in \mathbb{Z}_0$$

$$\sqrt[n]{a} = a^{\frac{1}{n}}$$

$$\sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b}$$

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt[n]{a^m} = (\sqrt[n]{a})^m = a^{\frac{m}{n}}$$

$$\sqrt[n]{\sqrt[m]{a}} = \sqrt[m \cdot n]{a}$$

$$\sqrt[n \cdot p]{a^{m \cdot p}} = \sqrt[n]{a^m}$$

$$\sqrt[n]{a^n} = a$$

