

# Puissances et racines

## Exercice 1.

a)  $\sqrt[17]{a^{11}}$

$\sqrt[11]{b^5}$

b)  $b^{\frac{17}{10}} = \sqrt[10]{b^{17}} = \sqrt[10]{b^{10} \cdot b^7} = b \sqrt[10]{b^7}$

$a^{\frac{31}{21}} = \sqrt[21]{a^{31}} = \sqrt[21]{a^{21} \cdot a^{10}} = a \sqrt[21]{a^{10}}$

c)  $\frac{6+27}{10} = \frac{33}{10}$

$\frac{10+4}{7} = 2$

## Exercice 2.

a)  $a^{\frac{1}{5}-\frac{1}{2}} = a^{-\frac{3}{10}} = \frac{1}{\sqrt[10]{a^3}}$

$a^{\frac{1}{4}-\frac{1}{2}} = a^{-\frac{1}{4}} = \frac{1}{\sqrt[4]{a}}$

b)  $b^{\frac{9}{2}-4-\frac{2}{5}} = b^{\frac{1}{10}} = \sqrt[10]{b}$

$b^{\frac{15}{2}-6-\frac{3}{5}} = b^{\frac{9}{10}} = \sqrt[10]{b^9}$

c)  $c^{\frac{1}{5}-\frac{1}{6}} = c^{\frac{1}{30}} = \sqrt[30]{c}$

$c^{\frac{1}{10}-\frac{1}{12}} = c^{\frac{1}{60}} = \sqrt[60]{c}$

d)  $\sqrt{11 \cdot 11^{\frac{1}{3}}} = \sqrt{11^{\frac{4}{3}}} = 11^{\frac{2}{3}} = \sqrt[3]{11^2} = \sqrt[3]{121}$

$\sqrt{7 \cdot 7^{\frac{1}{4}}} = \sqrt{7^{\frac{5}{4}}} = 7^{\frac{5}{8}} = \sqrt[8]{7^5}$

e)  $\left(a^{\frac{3}{5}-\frac{1}{3}}\right)^{\frac{1}{2}} = \left(a^{\frac{4}{15}}\right)^{\frac{1}{2}} = a^{\frac{2}{15}} = \sqrt[15]{a^2}$

$\left(a^{\frac{4}{3}-\frac{5}{4}}\right)^{\frac{1}{2}} = \left(a^{\frac{1}{12}}\right)^{\frac{1}{2}} = a^{\frac{1}{24}} = \sqrt[24]{a}$

f)  $\left(\frac{2^3}{5^3}\right)^{\frac{4}{3}} = \frac{2^4}{5^4} = \frac{16}{625}$

$\left(\frac{3^3}{2^3}\right)^{\frac{2}{3}} = \frac{3^2}{2^2} = \frac{9}{4}$

**Exercice 3.**

$$\text{a) } V = \frac{4 \cdot \pi \cdot 5^3}{3} = 523.60 \text{ cm}^3$$

$$V = \frac{4 \cdot \pi \cdot 7^3}{3} = 1436.76 \text{ cm}^3$$

$$\text{b) } r = \sqrt[3]{\frac{3 \cdot 150}{4 \cdot \pi}} = 3.30 \text{ dm}$$

$$r = \sqrt[3]{\frac{3 \cdot 100}{4 \cdot \pi}} = 2.88 \text{ dm}$$