

Algèbre - Chapitre 1 : Puissances et racines

Série A

Série B

Exercice 1. (6 pts)

$$a) a^3 \cdot a^5 = a^{3+5} = a^8$$

$$b) b^4 \cdot b^{-7} = b^{4-7} = b^{-3}$$

$$c) (c^{-77})^0 = 1$$

$$d) x^3 \cdot x^3 \cdot x^3 = x^{3+3+3} = x^9$$

$$e) (y^3 \cdot y^{-5})^2 = (y^{-2})^2 = y^{-4}$$

$$f) \frac{z^n}{z^{n+1}} = z^{n-(n+1)} = z^{-1}$$

$$a^5 \cdot a^4 = a^{5+4} = a^9$$

$$b^3 \cdot b^{-5} = b^{3-5} = b^{-2}$$

$$(c^{-88})^0 = 1$$

$$x^4 \cdot x^4 \cdot x^4 = x^{4+4+4} = x^{12}$$

$$(y^2 \cdot y^{-4})^3 = (y^{-2})^3 = y^{-6}$$

$$\frac{z^n}{z^{n+2}} = z^{n-(n+2)} = z^{-2}$$

Exercice 2. (1.5+2+1.5+2= pts)

$$a) \sqrt{125} - \sqrt{5} = 5\sqrt{5} - \sqrt{5} = 4\sqrt{5}$$

$$b) \frac{6}{\sqrt{18}} = \frac{6}{3\sqrt{2}} = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

$$c) \sqrt[4]{a^3} \cdot \sqrt[4]{a^7} = \sqrt[4]{a^{10}} = a^{\frac{10}{4}} = a^{\frac{5}{2}} = \sqrt{a^5}$$

$$d) \sqrt{x\sqrt{x}} = \sqrt{\sqrt{x^3}} = \sqrt[4]{x^3}$$

$$\sqrt{75} - \sqrt{3} = 5\sqrt{3} - \sqrt{3} = 4\sqrt{3}$$

$$\frac{15}{\sqrt{45}} = \frac{15}{3\sqrt{5}} = \frac{5}{\sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$$

$$\sqrt[4]{a^5} \cdot \sqrt[4]{a^9} = \sqrt[4]{a^{14}} = a^{\frac{14}{4}} = a^{\frac{7}{2}} = \sqrt{a^7}$$

$$\sqrt{x\sqrt{x}} = \sqrt{\sqrt{x^3}} = \sqrt[4]{x^3}$$

Exercice 3. (2 pts)

$$4 \cdot x^5 = 200 \quad | : 4$$

$$\Rightarrow x^5 = \frac{200}{4}$$

$$\Rightarrow x = \sqrt[5]{50} (\cong 2.187)$$

$$\Rightarrow S = \{ \sqrt[5]{50} \}$$

$$5 \cdot x^7 = 300 \quad | : 5$$

$$\Rightarrow x^7 = \frac{300}{5}$$

$$\Rightarrow x = \sqrt[7]{60} (\cong 1.795)$$

$$\Rightarrow S = \{ \sqrt[7]{60} \}$$

Exercice 4. (1+4=5 pts)

a) $m = 0.0108 \cdot 183^{1.7} \cong 75.79 \text{ kg}$

b) VAR : $h =$ taille d'un homme

EQ : $88 = 0.0108 \cdot h^{1.7}$

RES : $\Rightarrow h^{1.7} = \frac{88}{0.0108}$

$$\Rightarrow h = \sqrt[1.7]{\frac{88}{0.0108}} \cong 199.81 \text{ cm}$$

SOL : Sa taille est env. 199.81 cm

$m = 0.0097 \cdot 172^{1.7} \cong 61.26 \text{ kg}$

VAR : $h =$ taille d'une femme

EQ : $65 = 0.0097 \cdot h^{1.7}$

RES : $\Rightarrow h^{1.7} = \frac{65}{0.0097}$

$$\Rightarrow h = \sqrt[1.7]{\frac{65}{0.0097}} \cong 178.10 \text{ cm}$$

SOL : Sa taille est env. 178.1 cm