

Puissances et racines

Exercice 1.

$$a) a^{1+\frac{5}{7}} = a^{\frac{12}{7}}$$

$$a^{1+\frac{7}{5}} = a^{\frac{12}{5}}$$

$$b) b^{\frac{2}{n}}$$

$$b^{\frac{3}{n}}$$

$$c) \frac{c^{\frac{1}{2}} \cdot c^{\frac{5}{6}}}{c^2 \cdot c^{\frac{1}{3}}} = c^{\frac{4}{3}} \cdot c^{-\frac{7}{3}} = c^{-1} = \frac{1}{c}$$

$$\frac{c^{\frac{3}{4}} \cdot c^{\frac{3}{2}}}{c^4 \cdot c^{\frac{1}{4}}} = c^{\frac{9}{4}} \cdot c^{-\frac{17}{4}} = c^{-2} = \frac{1}{c^2}$$

Exercice 2.

$$a) \sqrt{7}b^3$$

$$\sqrt{5}b^4$$

$$b) \frac{b^{18}}{a^{12}}$$

$$\frac{a^{15}}{b^6}$$

$$c) x^{-0,5} = \frac{1}{\sqrt{x}}$$

$$x^{-1,5} = \frac{1}{\sqrt{x^3}}$$

$$d) \sqrt{10}a^6$$

$$\sqrt{7}a^8$$

$$e) \frac{a^2}{b^{31}}$$

$$\frac{b^{11}}{a^{32}}$$

$$f) 32x^5$$

$$81x^4$$

Exercice 3.

a) $x = \pm\sqrt{126} = \boxed{\pm 3\sqrt{14}}$

$x = \pm\sqrt{98} = \boxed{\pm 7\sqrt{2}}$

b) $x = \sqrt[3]{54} = \boxed{3\sqrt[3]{2}}$

$x = \sqrt[3]{32} = \boxed{2\sqrt[3]{4}}$

c) $x = 27^3 = \boxed{19683}$

$x = 64^3 = \boxed{262144}$

BONUS (2 pts)

$(2 - \sqrt{3})^2 = 4 - 4\sqrt{3} + 3 = 7 - 4\sqrt{3}$

$(\sqrt{3} - 1)^2 = 3 - 2\sqrt{3} + 1 = 4 - 2\sqrt{3}$

$(2 - \sqrt{3})^4 = (7 - 4\sqrt{3})^2 =$

$(\sqrt{3} - 1)^4 = (4 - 2\sqrt{3})^2 =$

$49 - 56\sqrt{3} + 48 = \boxed{97 - 56\sqrt{3}}$

$16 - 16\sqrt{3} + 12 = \boxed{28 - 16\sqrt{3}}$