Puissances et racines

Exercice 1.

a) $a^{\frac{6}{11}-\frac{1}{2}} = a^{\frac{1}{22}} = \boxed{\sqrt[22]{a}}$

$a^{\frac{5}{9}-\frac{1}{2}} = a^{\frac{1}{18}} = \boxed{\sqrt[18]{a}}$

b) $b^{\frac{12}{4n}} = b^{\frac{3}{n}} = \boxed{\sqrt[n]{b^3}}$

$b^{\frac{15}{3n}} = b^{\frac{5}{n}} = \boxed{\sqrt[n]{b^5}}$

c) $\dfrac{c^{\frac{1}{2}} \cdot c^{\frac{4}{5}}}{c \cdot c^{\frac{1}{3}}} = \dfrac{c^{\frac{13}{10}}}{c^{\frac{4}{3}}} = c^{\frac{13}{10}-\frac{4}{3}} = c^{-\frac{1}{30}}$

$= \boxed{\dfrac{1}{\sqrt[30]{c}} = \dfrac{\sqrt[30]{c^{29}}}{c}}$

$\dfrac{c \cdot c^{\frac{1}{2}}}{c^{\frac{1}{3}} \cdot c^{\frac{5}{4}}} = \dfrac{c^{\frac{3}{2}}}{c^{\frac{19}{12}}} = c^{\frac{3}{2}-\frac{19}{12}} = c^{-\frac{1}{12}}$

$= \boxed{\dfrac{1}{\sqrt[12]{c}} = \dfrac{\sqrt[12]{c^{11}}}{c}}$

Exercice 2.

a) $\boxed{5^{\frac{1}{2}} \cdot b^4}$

$\boxed{7^{\frac{1}{2}} \cdot b^5}$

b) $\boxed{\dfrac{a^8}{b^6}}$

$\boxed{\dfrac{a^{11}}{b^3}}$

c) $y^{-0,5} = \boxed{\dfrac{1}{y^{\frac{1}{2}}}}$

$y^{-1} = \boxed{\dfrac{1}{y}}$

d) $a^{\frac{3}{2}} \cdot 6^{\frac{1}{2}} \cdot a^5 = \boxed{6^{\frac{1}{2}} \cdot a^{\frac{13}{2}}}$

$a^{\frac{5}{2}} \cdot 3 \cdot a^7 = \boxed{3 \cdot a^{\frac{19}{2}}}$

e) $\dfrac{c^{\frac{5}{4}}}{c^{\frac{10}{3}}} = c^{\frac{5}{4}-\frac{10}{3}} = c^{-\frac{25}{12}} = \boxed{\dfrac{1}{c^{\frac{25}{12}}}}$

$\dfrac{c^{\frac{11}{6}}}{c^{\frac{17}{4}}} = c^{\frac{11}{6}-\frac{17}{4}} = c^{-\frac{29}{12}} = \boxed{\dfrac{1}{c^{\frac{29}{12}}}}$

f) $(5^3x^6)^{\frac{1}{3}} = \boxed{5x^2}$

$(2^5x^{10})^{\frac{2}{5}} = \boxed{4x^4}$

Exercice 3.

a) $x = \pm\sqrt{150} = \boxed{\pm 5\sqrt{6}}$	$x = \pm\sqrt{108} = \boxed{\pm 6\sqrt{3}}$
b) $x = \sqrt[3]{56} = \boxed{2\sqrt[3]{7}}$	$x = \sqrt[3]{80} = \boxed{2\sqrt[3]{10}}$
c) $x = 64^3 = \boxed{262'144}$	$x = 125^3 = \boxed{1'953'125}$