Opdracht

① a) $\frac{1}{a^n}$ b) $\sqrt[m]{a^n} = \left(\sqrt[m]{a}\right)^n$ c) a^{p+q}

d) $a^p \cdot b^p$ e) $a^{p \cdot q}$ f) $\left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

② a) $2\sqrt{2} = 2^1 \cdot 2^{1/2} = 2^{1+\frac{1}{2}} = 2^{\frac{2}{2}+\frac{1}{2}} = \boxed{2^{\frac{3}{2}}}$

b) $64^{-1} = (8^2)^{-1} = ((2^3)^2)^{-1} = \boxed{2^{-6}}$

c) $\sqrt[3]{128} = \sqrt[3]{2^7} = \boxed{2^{7/3}}$

d) $\frac{1}{2^3 \cdot 2^{1/2}} = \frac{1}{2^{6/2+1/2}} = \frac{1}{2^{7/2}} = \boxed{2^{-7/2}}$

e) $1 = \boxed{2^0}$

③ $\sqrt{2^n \cdot a^n \cdot a \cdot b^n \cdot b^2} = \sqrt[n]{2^n} \cdot \sqrt[n]{a^n} \cdot \sqrt[n]{b^n} \cdot \sqrt[n]{ab^2}$

$= 2 \cdot a \cdot b \cdot \sqrt[n]{ab^2}$

④ $\frac{(a^2 \cdot b^{-3} \cdot c^{+4})^5}{(a^{-1} \cdot c^{-2})^{-3}} = \frac{a^{10} \cdot b^{-15} \cdot c^{20}}{a^3 c^6} = a^7 b^{-15} \cdot c^{14}$

$= \boxed{\frac{a^7 \cdot c^{14}}{b^{15}}}$

⑤ $\frac{3^{\frac{2}{3}} \cdot 2^{-\frac{1}{2}} \cdot 9^0 \cdot 3^{\frac{1}{3}}}{2^{1/2} \cdot 3^{-1}} = 3^{\frac{2}{3}+\frac{1}{3}+1} \cdot 2^{-\frac{1}{2}-\frac{1}{2}} \cdot 1$

$= 3^2 \cdot 2^{-1} = \boxed{\frac{9}{4}}$ (D)

(6) $\left(\sqrt[6]{8} - \sqrt[6]{27}\right)^2 = \left(\sqrt[6]{8}\right)^2 - 2\sqrt[6]{8}\cdot\sqrt[6]{27} + \left(\sqrt[6]{27}\right)^2$

$= \left(\sqrt[6]{2^3}\right)^2 - 2\sqrt[6]{2^3\cdot 3^3} + \left(\sqrt[6]{3^3}\right)^2$

$= \sqrt[6]{2^6} - 2\sqrt[6]{6^3} + \sqrt[6]{3^6}$

$= 2 - 2\cdot 6^{3/6} + 3$

$= 5 - 2\cdot 6^{1/2}$

$= 5 - 2\sqrt{6}$

(7) $4\cdot x^{-0,75} = 108$

$x^{-3/4} = \frac{108}{4} = 27$

$\left(x^{3/4}\right)^4 = \left(\frac{1}{27}\right)^4$

$\left(x^3\right)^{1/3} = \left(\frac{1}{27^4}\right)^{1/3}$

$x = \frac{1}{3^4}$

$x = \boxed{\frac{1}{81}}$