

EJERCICIOS RESUELTOS CON RAÍCES 3° EE ESO

- a) $\frac{\sqrt[4]{27}}{\sqrt[3]{18}} = \frac{\sqrt[4]{3^3}}{\sqrt[3]{2 \cdot 3^2}} = \sqrt[12]{\frac{(3^3)^3}{(2 \cdot 3^2)^4}} = \sqrt[12]{\frac{3^9}{2^4 \cdot 3^8}} = \sqrt[12]{\frac{3}{2^4}} = \sqrt[12]{\frac{3}{16}}$
- b) $\sqrt[4]{-80} : \sqrt[3]{18} = \frac{-\sqrt[4]{2^4 \cdot 5}}{\sqrt[3]{2 \cdot 3^2}} = -\frac{2\sqrt[4]{5}}{\sqrt[3]{2 \cdot 3^2}} = \frac{2\sqrt[4]{5^3}}{\sqrt[4]{(2 \cdot 3^2)^4}} = 2 \cdot \sqrt[4]{\frac{5^3}{2^4 \cdot 3^8}}$
 $= \frac{\cancel{2} \cdot \sqrt[4]{5^3}}{\cancel{2} \cdot 3^2} = \frac{\sqrt[4]{75}}{9}$
- c) $\left(\sqrt[15]{-\frac{1}{243}}\right)^3 = \left(-\sqrt[15]{\frac{1}{3^5}}\right)^3 = -\sqrt[15]{\left(\frac{1}{3^5}\right)^3} = -\sqrt[5]{\frac{1}{3^{15}}} = -\frac{1}{3^3} = -\frac{1}{27}$
- d) $\sqrt[3]{\sqrt{2}} \cdot \sqrt[3]{16} = \sqrt[6]{2} \cdot \sqrt[3]{16} = \sqrt[6]{2 \cdot 16^2} = \sqrt[6]{2 \cdot (2^4)^2} = \sqrt[6]{2^9} = \sqrt[6]{2^6 \cdot 2^3} = 2 \cdot \sqrt[6]{2^3} = 2 \cdot \sqrt{2}$
- e) $\sqrt[3]{\sqrt{2}} \cdot \sqrt[3]{16} = \sqrt[6]{2} \cdot \sqrt[3]{16} = \sqrt[6]{2 \cdot 16^2} = \sqrt[6]{2 \cdot (2^4)^2} = \sqrt[6]{2^9} = \sqrt[6]{2^6 \cdot 2^3} = 2 \cdot \sqrt[6]{2^3} = 2 \cdot \sqrt{2}$
- f) $\sqrt{\frac{3\sqrt{2}}{8}} = \sqrt{\frac{\sqrt{3^2 \cdot 2}}{2 \cdot 2^2}} = \frac{1}{2} \sqrt{\frac{3^2 \cdot 2}{2^2}} = \frac{1}{2} \sqrt{\frac{3^2 \cdot 2}{2^2}} = \frac{1}{2} \sqrt{\frac{9}{2}}$
- g) $\frac{(\sqrt[4]{3^2})^2 \cdot (\sqrt[3]{3})^6}{(\sqrt[12]{3^4})^6} = \frac{\sqrt[4]{3^4} \cdot \sqrt[3]{3^6}}{\sqrt[12]{3^{24}}} = \frac{3 \cdot 3^2}{3^2} = 3$
- h) $\frac{(\sqrt[5]{3})^4 \cdot (\sqrt[3]{3})^2}{(\sqrt{3^4})^3} = \frac{\sqrt[5]{3^4} \cdot \sqrt[3]{3^2}}{\sqrt{3^{12}}} = \frac{\sqrt[15]{(3^4)^3 \cdot (3^2)^5}}{3^2} = \frac{\sqrt[15]{3^{12} \cdot 3^{10}}}{3^2} = \frac{\sqrt[15]{3^{22}}}{3^2} = \sqrt[15]{\frac{3^{22}}{3^{30}}} = \sqrt[15]{\frac{1}{3^8}}$
- i) $\sqrt{\sqrt[4]{64^4}} = \sqrt{\sqrt[4]{(2^6)^4}} = \sqrt{2^3 \cdot 2^4} = \sqrt{2^7} = 2^3 \cdot \sqrt{2} = 8\sqrt{2}$
- j) $\sqrt{8} - \sqrt{50} - \frac{1}{2}\sqrt{98} = \sqrt{2^2 \cdot 2} - \sqrt{2 \cdot 5^2} - \frac{1}{2}\sqrt{7^2 \cdot 2} = 2\sqrt{2} - 5\sqrt{2} - 7\sqrt{2} = -10\sqrt{2}$
- k) $\frac{1}{2}\sqrt{3} - \sqrt{12} - \frac{3}{4}\sqrt{75} = \frac{1}{2}\sqrt{3} - \sqrt{2^2 \cdot 3} - \frac{3}{4}\sqrt{5^2 \cdot 3} = \frac{1}{2}\sqrt{3} - 2\sqrt{3} - \frac{3 \cdot 5}{4}\sqrt{3} =$
 $= \frac{1}{2}\sqrt{3} - 2\sqrt{3} - \frac{15}{4}\sqrt{3} = -\frac{21}{4}\sqrt{3}$