## Ejercicio 6

- CASO I $\dfrac{a}{b\sqrt{c}} \rightarrow$ Se multiplica en el numerador y en el denominador por el radical que aparece en el denominador y se opera.
- CASO II $\dfrac{a}{\sqrt{b}+\sqrt{c}} \rightarrow$ Se multiplica en el numerador y en el denominador por el conjugado del denominador y se opera.
- CASO IIII $\dfrac{a}{b\cdot\sqrt[n]{c^m}} \rightarrow$ Se multiplica en el numerador y en el denominador por $\sqrt[n]{c^{n-m}}$ y se opera.

a) $\dfrac{7-\sqrt{7}}{\sqrt{14}} = \dfrac{(7-\sqrt{7})\cdot\sqrt{14}}{\sqrt{14}\cdot\sqrt{14}} = \dfrac{7\sqrt{14}-\sqrt{98}}{14} = \dfrac{7\sqrt{14}-\sqrt{2\cdot 7^2}}{14} = \dfrac{7\sqrt{14}-7\sqrt{2}}{14} \underset{\text{Simplif. }(:7)}{=} \dfrac{\sqrt{14}-\sqrt{2}}{2}$

b) $\dfrac{5-\sqrt{10}}{2\sqrt{5}} = \dfrac{(5-\sqrt{10})\cdot\sqrt{5}}{2\cdot\underbrace{\sqrt{5}\cdot\sqrt{5}}_{5}} = \dfrac{5\sqrt{5}-\sqrt{50}}{10} = \dfrac{5\sqrt{5}-\sqrt{2\cdot 5^2}}{10} = \dfrac{5\sqrt{5}-5\sqrt{2}}{10} \underset{\text{Simplif. }(:5)}{=} \dfrac{\sqrt{5}-\sqrt{2}}{2}$

c) $\dfrac{3-\sqrt{3}}{\sqrt{6}} = \dfrac{(3-\sqrt{3})\cdot\sqrt{6}}{\sqrt{6}\cdot\sqrt{6}} = \dfrac{3\sqrt{6}-\sqrt{18}}{6} = \dfrac{3\sqrt{6}-\sqrt{2\cdot 3^2}}{6} = \dfrac{3\sqrt{6}-3\sqrt{2}}{6} \underset{\text{Simplif. }(:3)}{=} \dfrac{\sqrt{6}-\sqrt{2}}{2}$

d) $\dfrac{3\sqrt{3}+9}{5\sqrt{3}} = \dfrac{(3\sqrt{3}+9)\cdot\sqrt{3}}{5\sqrt{3}\cdot\sqrt{3}} = \dfrac{9+9\sqrt{3}}{15} \underset{(:3)}{=} \dfrac{3+3\sqrt{3}}{5}$

e) $\dfrac{4}{\sqrt[7]{32}} = \dfrac{4}{\sqrt[7]{2^5}} = \dfrac{4\cdot\sqrt[7]{2^2}}{\sqrt[7]{2^5}\cdot\sqrt[7]{2^2}} = \dfrac{4\cdot\sqrt[7]{4}}{\sqrt[7]{2^7}} = \dfrac{4\cdot\sqrt[7]{4}}{2} = 2\sqrt[7]{4}$

f) $\dfrac{18}{\sqrt[7]{81}} = \dfrac{18}{\sqrt[7]{3^4}} = \dfrac{18\cdot\sqrt[7]{3^3}}{\sqrt[7]{3^4}\cdot\sqrt[7]{3^3}} = \dfrac{18\cdot\sqrt[7]{27}}{\sqrt[7]{3^7}} = \dfrac{18\cdot\sqrt[7]{27}}{3} = 6\sqrt[7]{27}$

g) $\dfrac{1+\sqrt[3]{2}}{\sqrt[3]{4}} = \dfrac{1+\sqrt[3]{2}}{\sqrt[3]{2^2}} = \dfrac{(1+\sqrt[3]{2})\cdot\sqrt[3]{2}}{\sqrt[3]{2^2}\cdot\sqrt[3]{2}} = \dfrac{\sqrt[3]{2}+\sqrt[3]{4}}{\sqrt[3]{2^3}} = \dfrac{\sqrt[3]{2}+\sqrt[3]{4}}{2}$

h) $\dfrac{\sqrt[3]{6}-2}{\sqrt[3]{9}} = \dfrac{\sqrt[3]{6}-2}{\sqrt[3]{3^2}} = \dfrac{(\sqrt[3]{6}-2)\cdot\sqrt[3]{3}}{\sqrt[3]{3^2}\cdot\sqrt[3]{3}} = \dfrac{\sqrt[3]{18}-2\sqrt[3]{3}}{\sqrt[3]{3^3}} = \dfrac{\sqrt[3]{18}-2\sqrt[3]{3}}{3}$

i) $\dfrac{1-\sqrt{5}}{2\sqrt{5}+1} = \dfrac{(1-\sqrt{5})\cdot(2\sqrt{5}-1)}{(2\sqrt{5}+1)\cdot(2\sqrt{5}-1)} = \dfrac{2\sqrt{5}-1-2\cdot 5+\sqrt{5}}{(2\sqrt{5})^2-(1)^2} = \dfrac{2\sqrt{5}-1-10+\sqrt{5}}{4\cdot 5-1} = \dfrac{3\sqrt{5}-11}{19}$

j) $\dfrac{6-\sqrt{3}}{2\sqrt{3}+3} = \dfrac{(6-\sqrt{3})\cdot(2\sqrt{3}-3)}{(2\sqrt{3}+3)\cdot(2\sqrt{3}-3)} = \dfrac{12\sqrt{3}-18-2\cdot 3+3\sqrt{3}}{\underbrace{(2\sqrt{3})^2}_{4\cdot 3}-\underbrace{(3)^2}_{9}} = \dfrac{15\sqrt{3}-24}{3} \underset{(:3)}{=} 5\sqrt{3}-8$

k) $\dfrac{4-2\sqrt{2}}{3\sqrt{8}-2} = \dfrac{(4-2\sqrt{2})\cdot(3\sqrt{8}+2)}{(3\sqrt{8}-2)\cdot(3\sqrt{8}+2)} = \dfrac{12\sqrt{8}+8-6\cdot\sqrt{16}-4\sqrt{2}}{\underbrace{(3\sqrt{8})^2}_{9\cdot 8}-(2)^2} = \dfrac{12\sqrt{2^3}+8-6\cdot 4-4\sqrt{2}}{72-4} =$

$= \dfrac{24\sqrt{2}+8-24-4\sqrt{2}}{68} = \dfrac{20\sqrt{2}-16}{68} \underset{(:4)}{=} \dfrac{5\sqrt{2}-4}{17}$

l) $$\frac{3\sqrt{3}-2\sqrt{2}}{2\sqrt{3}+3\sqrt{2}}=\frac{(3\sqrt{3}-2\sqrt{2})\cdot(2\sqrt{3}-3\sqrt{2})}{(2\sqrt{3}+3\sqrt{2})\cdot(2\sqrt{3}-3\sqrt{2})}=\frac{6\cdot 3-9\sqrt{6}-4\sqrt{6}+6\cdot 2}{(2\sqrt{3})^2-(3\sqrt{2})^2}=\frac{18-13\sqrt{6}+12}{4\cdot 3-9\cdot 2}=$$

$$=\frac{30-13\sqrt{6}}{12-18}=\frac{30-13\sqrt{6}}{-6}=\frac{13\sqrt{6}-30}{6}$$