

**9 Racionaliza denominadores y simplifica cuanto puedas.**

a)  $\frac{5}{\sqrt{7}}$

b)  $\frac{3}{\sqrt[3]{4}}$

c)  $\frac{\sqrt{7}}{\sqrt{3}}$

d)  $\frac{1}{\sqrt{a^3}}$

e)  $\frac{3}{\sqrt{50}}$

f)  $\frac{4}{\sqrt{18}}$

g)  $\frac{2}{\sqrt[3]{25}}$

h)  $\frac{1}{\sqrt[3]{40}}$

i)  $\frac{3}{\sqrt[3]{36}}$

j)  $\frac{2}{\sqrt[3]{100}}$

a)  $\frac{5}{\sqrt{7}} = \frac{5\sqrt{7}}{7}$

b)  $\frac{3}{\sqrt[3]{4}} = \frac{3}{\sqrt[3]{2^2}} = \frac{3\sqrt[3]{2}}{2}$

c)  $\frac{\sqrt{7}}{\sqrt{3}} = \frac{\sqrt{7}}{\sqrt{3}} = \frac{\sqrt{21}}{3}$

d)  $\frac{1}{\sqrt{a^3}} = \frac{1}{a\sqrt{a}} = \frac{\sqrt{a}}{a^2}$

e)  $\frac{3}{\sqrt{50}} = \frac{3}{\sqrt{2 \cdot 5^2}} = \frac{3}{5\sqrt{2}} = \frac{3\sqrt{2}}{10}$

f)  $\frac{4}{\sqrt{18}} = \frac{4}{\sqrt{2 \cdot 3^2}} = \frac{4}{3\sqrt{2}} = \frac{4\sqrt{2}}{6} = \frac{2\sqrt{2}}{3}$

g)  $\frac{2}{\sqrt[3]{25}} = \frac{2}{\sqrt[3]{5^2}} = \frac{2\sqrt[3]{5}}{5}$

h)  $\frac{1}{\sqrt[3]{40}} = \frac{1}{\sqrt[3]{2^3 \cdot 5}} = \frac{1}{2\sqrt[3]{5}} = \frac{\sqrt[3]{5^2}}{10} = \frac{\sqrt[3]{25}}{10}$

i)  $\frac{3}{\sqrt[3]{36}} = \frac{3}{\sqrt[3]{2^2 \cdot 3^2}} = \frac{3\sqrt[3]{2 \cdot 3}}{2 \cdot 3} = \frac{3\sqrt[3]{6}}{6} = \frac{\sqrt[3]{6}}{2}$

j)  $\frac{2}{\sqrt[3]{100}} = \frac{2}{\sqrt[3]{2^2 \cdot 5^2}} = \frac{2\sqrt[3]{2 \cdot 5}}{2 \cdot 5} = \frac{2\sqrt[3]{10}}{10} = \frac{\sqrt[3]{10}}{5}$

**10 Racionaliza denominadores y simplifica cuanto puedas.**

a)  $\frac{1}{\sqrt{2+1}}$

b)  $\frac{x+y}{\sqrt{x}+\sqrt{y}}$

c)  $\frac{a-1}{\sqrt{a}-1}$

d)  $\frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}}$

e)  $\frac{1}{2\sqrt{3}-\sqrt{5}}$

f)  $\frac{3\sqrt{2}+2\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}$

g)  $\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}-1} + \frac{1}{\sqrt{2}+1}$

h)  $\frac{1}{\sqrt{x}-\sqrt{y}} + \frac{1}{\sqrt{x}+\sqrt{y}}$

a)  $\frac{\sqrt{2}-1}{(\sqrt{2}-1)(\sqrt{2}+1)} = \frac{\sqrt{2}-1}{2-1} = \sqrt{2}-1$

b)  $\frac{(x+y)(\sqrt{x}-\sqrt{y})}{(\sqrt{x}+\sqrt{y})(\sqrt{x}-\sqrt{y})} = \frac{(x+y)(\sqrt{x}-\sqrt{y})}{x-y} = \frac{x\sqrt{x}-x\sqrt{y}+y\sqrt{x}-y\sqrt{y}}{x-y}$

c)  $\frac{(a-1)(\sqrt{a}+1)}{(\sqrt{a}-1)(\sqrt{a}+1)} = \frac{(a-1)(\sqrt{a}+1)}{(a-1)} = \sqrt{a}+1$

d)  $\frac{(\sqrt{x}+\sqrt{y})(\sqrt{x}+\sqrt{y})}{(\sqrt{x}-\sqrt{y})(\sqrt{x}+\sqrt{y})} = \frac{x+y+2\sqrt{xy}}{x-y}$

e)  $\frac{(2\sqrt{3}+\sqrt{5})}{(2\sqrt{3}-\sqrt{5})(2\sqrt{3}+\sqrt{5})} = \frac{2\sqrt{3}+\sqrt{5}}{12-5} = \frac{2\sqrt{3}+\sqrt{5}}{7}$

f)  $\frac{(3\sqrt{2}+2\sqrt{3})^2}{18-12} = \frac{18+12+12\sqrt{6}}{6} = \frac{30+12\sqrt{6}}{6} = 5+2\sqrt{6}$

g)  $\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}-1} + \frac{1}{\sqrt{2}+1} = \frac{(\sqrt{2}-1)(\sqrt{2}+1) + \sqrt{2}(\sqrt{2}+1) + \sqrt{2}(\sqrt{2}-1)}{\sqrt{2}(\sqrt{2}-1)(\sqrt{2}+1)} = \frac{(2-1)+2+\sqrt{2}+2-\sqrt{2}}{\sqrt{2}(2-1)} = \frac{5}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$

h)  $\frac{\sqrt{x}+\sqrt{y}+\sqrt{x}-\sqrt{y}}{x-y} = \frac{2\sqrt{x}}{x-y}$

**28 Racionaliza y simplifica.**

a)  $\frac{2\sqrt{3}-\sqrt{2}}{\sqrt{18}}$

b)  $\frac{2\sqrt{3}+\sqrt{2}}{\sqrt{12}}$

c)  $\frac{1}{2(\sqrt{3}-\sqrt{5})}$

d)  $\frac{3}{\sqrt{5}-2}$

e)  $\frac{13\sqrt{10}}{\sqrt{5}-3\sqrt{2}}$

f)  $\frac{3\sqrt{6}+2\sqrt{2}}{3\sqrt{3}+2}$

a)  $\frac{2\sqrt{3}-\sqrt{2}}{\sqrt{2}\cdot 3^2} = \frac{2\sqrt{3}-\sqrt{2}}{3\sqrt{2}} = \frac{(2\sqrt{3}-\sqrt{2})\sqrt{2}}{3\sqrt{2}\cdot\sqrt{2}} = \frac{2\sqrt{6}-2}{3\cdot 2} = \frac{2(\sqrt{6}-1)}{3\cdot 2} = \frac{\sqrt{6}-1}{3}$

b)  $\frac{2\sqrt{3}+\sqrt{2}}{\sqrt{2^2\cdot 3}} = \frac{2\sqrt{3}+\sqrt{2}}{2\sqrt{3}} = \frac{(2\sqrt{3}+\sqrt{2})\sqrt{3}}{2\sqrt{3}\cdot\sqrt{3}} = \frac{6+\sqrt{6}}{6} = 1 + \frac{\sqrt{6}}{6}$

c)  $\frac{(\sqrt{3}+\sqrt{5})}{2(\sqrt{3}-\sqrt{5})(\sqrt{3}+\sqrt{5})} = \frac{\sqrt{3}+\sqrt{5}}{2(3-5)} = \frac{\sqrt{3}+\sqrt{5}}{-4} = -\frac{\sqrt{3}+\sqrt{5}}{4}$

d)  $\frac{3(\sqrt{5}+2)}{(\sqrt{5}-2)(\sqrt{5}+2)} = \frac{3(\sqrt{5}+2)}{5-4} = 3(\sqrt{5}+2) = 3\sqrt{5}+6$

e)  $\frac{13\sqrt{10}}{\sqrt{5}-3\sqrt{2}} \cdot \frac{(\sqrt{5}+3\sqrt{2})}{(\sqrt{5}+3\sqrt{2})} = \frac{13\sqrt{10}(\sqrt{5}+3\sqrt{2})}{5-9\cdot 2} = \frac{65\sqrt{2}+78\sqrt{5}}{-13} = -5\sqrt{2}-6\sqrt{5}$

f)  $\frac{(3\sqrt{6}+2\sqrt{2})(3\sqrt{3}-2)}{(3\sqrt{3}+2)(3\sqrt{3}-2)} = \frac{9\sqrt{18}-6\sqrt{6}+6\sqrt{6}-4\sqrt{2}}{27-4} = \frac{9\sqrt{2}\cdot 3^2-4\sqrt{2}}{23} = \frac{27\sqrt{2}-4\sqrt{2}}{23} = \frac{23\sqrt{2}}{23} = \sqrt{2}$

**29 Efectúa y simplifica.**

a)  $\frac{3}{\sqrt{3}-\sqrt{2}} - \frac{2}{\sqrt{3}+\sqrt{2}}$

b)  $\frac{\sqrt{7}-\sqrt{5}}{\sqrt{7}+\sqrt{5}} - \frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}$

a)  $\frac{3(\sqrt{3}+\sqrt{2})-2(\sqrt{3}-\sqrt{2})}{(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})} = \frac{3\sqrt{3}+3\sqrt{2}-2\sqrt{3}+2\sqrt{2}}{3-2} = \sqrt{3}+5\sqrt{2}$

b)  $\frac{(\sqrt{7}-\sqrt{5})^2 - (\sqrt{7}+\sqrt{5})^2}{(\sqrt{7}+\sqrt{5})(\sqrt{7}-\sqrt{5})} = \frac{(\sqrt{7}-\sqrt{5}+\sqrt{7}+\sqrt{5})(\sqrt{7}-\sqrt{5}-\sqrt{7}-\sqrt{5})}{7-5} = \frac{2\sqrt{7}(-2\sqrt{5})}{2} = -2\sqrt{35}$