

5. Realizar las siguientes operaciones:

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

b)  $\sqrt{\frac{5}{\sqrt{2}-1}} \cdot \sqrt{\frac{3}{1+\sqrt{2}}}$

c)  $\sqrt[3]{\frac{1}{1+\sqrt{3}}} \cdot \sqrt[6]{\frac{1+\sqrt{3}}{\sqrt{3}-1}}$

d)  $\sqrt{\frac{ab^2}{a+b}} \cdot \sqrt{\frac{a^2b}{a-b}}$

**Solución**

a)  $\frac{5}{1-\sqrt{2}} + \frac{3}{1+\sqrt{2}} = \frac{5(1+\sqrt{2})+3(1-\sqrt{2})}{(1-\sqrt{2})(1+\sqrt{2})} = \frac{5+5\sqrt{2}+3-3\sqrt{2}}{1-2} = \frac{8+2\sqrt{2}}{-1} = -8-2\sqrt{2}$

b)  $\sqrt{\frac{5}{\sqrt{2}-1}} \cdot \sqrt{\frac{3}{1+\sqrt{2}}} = \sqrt{\frac{5 \cdot 3}{(\sqrt{2}-1)(\sqrt{2}+1)}} = \sqrt{\frac{15}{2-1}} = \sqrt{15}$

c)  $\sqrt[3]{\frac{1}{1+\sqrt{3}}} \cdot \sqrt[6]{\frac{1+\sqrt{3}}{\sqrt{3}-1}} = \sqrt[6]{\frac{1}{(1+\sqrt{3})^2}} \cdot \sqrt[6]{\frac{1+\sqrt{3}}{\sqrt{3}-1}} = \sqrt[6]{\frac{1+\sqrt{3}}{(1+\sqrt{3})^2(\sqrt{3}-1)}} = \sqrt[6]{\frac{1}{(1+\sqrt{3})(\sqrt{3}-1)}} = \sqrt[6]{\frac{1}{3-1}} = \sqrt[6]{\frac{1}{2}} = \frac{1}{\sqrt[6]{2}}$

d)  $\sqrt{\frac{ab^2}{a+b}} \cdot \sqrt{\frac{a^2b}{a-b}} = \sqrt{\frac{a^3b^3}{a^2-b^2}} = ab\sqrt{\frac{ab}{a^2-b^2}}$