RADICALI

Verifica le seguenti identità:

1. $\sqrt{x+y}-\sqrt{2x+y-2\sqrt{x^2+xy}}+\sqrt{xy-y^2}=\sqrt{x+y^2+2y\sqrt{x}}+\sqrt{xy-2y\sqrt{xy-y^2}}$
2. $\sqrt{x+2+2\sqrt{x+1}}-\sqrt{x+2-2\sqrt{x+1}}=\sqrt{x-y+2\sqrt{x-y-1}}-\sqrt{x-y-2\sqrt{x-y-1}}$
3. $\sqrt{a+b+2\sqrt{ab}}=\sqrt{a}+\sqrt{b}$
4. $\sqrt{a+b-2\sqrt{ab}}=\sqrt{a}-\sqrt{b}$
5. $\dfrac{a+\sqrt{a^2-1}}{a-\sqrt{a^2-1}}+\dfrac{a-\sqrt{a^2-1}}{a+\sqrt{a^2-1}}=2\,(2a^2-1)$
6. $\dfrac{\sqrt{x-y}}{\sqrt{x+y}+\sqrt{x-y}}-\dfrac{\sqrt{x+y}}{\sqrt{x+y}-\sqrt{x-y}}=-\dfrac{x}{y}$
7. $\dfrac{2\sqrt{mn}}{\sqrt{m}+\sqrt{n}+\sqrt{m+n}}=\sqrt{m}+\sqrt{n}-\sqrt{m+n}$
8. $\sqrt{a-b}-\sqrt{a}+\sqrt{b}=\dfrac{2\sqrt{b}\,(\sqrt{a}-\sqrt{b})}{\sqrt{a-b}+\sqrt{a}-\sqrt{b}}$

Risolvi le seguenti equazioni:

9. $\dfrac{x+\sqrt{3}}{\sqrt{3}-\sqrt{2}}-\dfrac{x-\sqrt{3}}{\sqrt{3}+\sqrt{2}}+\dfrac{x-\sqrt{3}}{\sqrt{3}}+\sqrt{3}\,x=\dfrac{3\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ $\qquad 2\sqrt{3}-\dfrac{3}{2}\sqrt{2}$
10. $\dfrac{\sqrt{2}}{x\sqrt{3}-\sqrt{6}}-\dfrac{x\sqrt{2}+2}{x^2\sqrt{3}+x\sqrt{6}+2\sqrt{3}}=\dfrac{2x+4\sqrt{2}}{x^3-2\sqrt{2}}$ $\qquad -2\sqrt{2}$
11. $\dfrac{x-\sqrt{3}}{x-\sqrt{5}}-\dfrac{x-\sqrt{5}}{x-\sqrt{3}}=\dfrac{\sqrt{5}-2\sqrt{3}-2}{x^2-x\,(\sqrt{5}+\sqrt{3})+\sqrt{15}}$ $\qquad -\dfrac{1}{4}\,(\sqrt{15}+1)$
12. $\dfrac{y}{\sqrt{3}}+\dfrac{y-2\sqrt{2}+1}{\sqrt{3}-1}=\dfrac{(2\sqrt{2}-1)\,(y-\sqrt{2})}{3-\sqrt{3}}$ $\qquad \dfrac{2\sqrt{2}-1}{2}$
13. $\dfrac{x}{\sqrt{3}+1}+\dfrac{x\sqrt{2}-2}{\sqrt{6}}=\dfrac{2\sqrt{2}\,x}{\sqrt{2}+\sqrt{6}}$ $\qquad \sqrt{2}+\sqrt{6}$
14. $(x+1)\,(\sqrt{5}-x)+1=\sqrt{5}\,(\sqrt{5}+1)-x\,(x+2)$ $\qquad \sqrt{5}-1+$
15. $(x-\sqrt{2})\,(\sqrt{3}-\sqrt{2})+2x\sqrt{2}-(x-\sqrt{3})\,(\sqrt{3}+\sqrt{2})=x\sqrt{8}$ $\qquad \dfrac{5}{4}\sqrt{2}$