

1) RAZIONALIZZAZIONE - SVOLGIMENTI

$$76) \frac{x}{2\sqrt{x}} = \frac{x}{2\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}} = \frac{\cancel{x}\sqrt{x}}{2\cancel{x}} = \boxed{\frac{\sqrt{x}}{2}} \quad \text{o anche:} \quad \frac{x}{2\sqrt{x}} = \frac{\sqrt{x} \cdot \cancel{\sqrt{x}}}{2\cancel{\sqrt{x}}} = \boxed{\frac{\sqrt{x}}{2}}$$

$$77) \frac{9-4t}{3-2\sqrt{t}} = \frac{9-4t}{3-2\sqrt{t}} \cdot \frac{3+2\sqrt{t}}{3+2\sqrt{t}} = \frac{\cancel{(9-4t)}(3+2\sqrt{t})}{\cancel{9-4t}} = \boxed{3+2\sqrt{t}}$$

o anche:  $\frac{9-4t}{3-2\sqrt{t}} = \frac{(3+2\sqrt{t})(\cancel{3-2\sqrt{t}})}{\cancel{3-2\sqrt{t}}} = \boxed{3+2\sqrt{t}}$

$$78) \frac{6}{3\sqrt{2}-2\sqrt{3}} = \frac{6}{3\sqrt{2}-2\sqrt{3}} \cdot \frac{3\sqrt{2}+2\sqrt{3}}{3\sqrt{2}+2\sqrt{3}} = \frac{6(3\sqrt{2}+2\sqrt{3})}{(3\sqrt{2})^2 - (2\sqrt{3})^2} = \frac{\cancel{6}(3\sqrt{2}+2\sqrt{3})}{\cancel{18-12}} = \boxed{3\sqrt{2}+2\sqrt{3}}$$

$$79) \frac{2\sqrt{x}-1}{2\sqrt{x}+1} = \frac{2\sqrt{x}-1}{2\sqrt{x}+1} \cdot \frac{2\sqrt{x}-1}{2\sqrt{x}-1} = \frac{(2\sqrt{x}-1)^2}{(2\sqrt{x})^2 - 1^2} = \boxed{\frac{4x+1-4\sqrt{x}}{4x-1}}$$

$$80) \frac{y}{\sqrt{x}-\sqrt{x+y}} = \frac{y}{\sqrt{x}-\sqrt{x+y}} \cdot \frac{\sqrt{x}+\sqrt{x+y}}{\sqrt{x}+\sqrt{x+y}} = \frac{y(\sqrt{x}+\sqrt{x+y})}{\cancel{\sqrt{x}}-\cancel{\sqrt{x+y}}} = \boxed{-(\sqrt{x}+\sqrt{x+y})}$$

$$81) \frac{a^2-1}{\sqrt{a+1}} = \frac{a^2-1}{\sqrt{a+1}} \cdot \frac{\sqrt{a+1}}{\sqrt{a+1}} = \frac{\cancel{(a+1)}(a-1)\sqrt{a+1}}{\cancel{a+1}} = \boxed{(a-1)\sqrt{a+1}}$$

$$82) \frac{2c-18}{3\sqrt{c}+9} = \frac{2(c-9)}{3(\sqrt{c}+3)} \cdot \frac{\sqrt{c}-3}{\sqrt{c}-3} = \frac{2\cancel{(c-9)}(\sqrt{c}-3)}{3\cancel{(c-9)}} = \boxed{\frac{2(\sqrt{c}-3)}{3} \text{ oppure } \frac{2}{3}(\sqrt{c}-3)}$$

$$83) \frac{1}{\sqrt{3}-\sqrt{5}} = \frac{1}{\sqrt{3}-\sqrt{5}} \cdot \frac{\sqrt{3}+\sqrt{5}}{\sqrt{3}+\sqrt{5}} = \frac{\sqrt{3}+\sqrt{5}}{\sqrt{(3-5)(3+5)}} = \frac{\sqrt{3}+\sqrt{5}}{\sqrt{9-5}} = \frac{\sqrt{3}+\sqrt{5}}{\sqrt{4}} = \boxed{\frac{\sqrt{3}+\sqrt{5}}{2}}$$

$$84) \frac{1}{\sqrt{5}+\sqrt{3}-1} = \frac{1}{\sqrt{5}+(\sqrt{3}-1)} \cdot \frac{\sqrt{5}-(\sqrt{3}-1)}{\sqrt{5}-(\sqrt{3}-1)} \stackrel{\text{NOTA 1}}{=} \frac{\sqrt{5}-\sqrt{3}+1}{(\sqrt{5})^2 - (\sqrt{3}-1)^2} =$$

$$= \frac{\sqrt{5}-\sqrt{3}+1}{5-(3+1-2\sqrt{3})} = \frac{\sqrt{5}-\sqrt{3}+1}{5-4+2\sqrt{3}} = \frac{\sqrt{5}-\sqrt{3}+1}{1+2\sqrt{3}} \stackrel{\text{NOTA 2}}{=}$$

$$= \frac{\sqrt{5}-\sqrt{3}+1}{2\sqrt{3}+1} \cdot \frac{2\sqrt{3}-1}{2\sqrt{3}-1} = \frac{2\sqrt{15}-\sqrt{5}-6+\sqrt{3}+2\sqrt{3}-1}{(2\sqrt{3})^2 - 1^2} =$$

$$= \frac{2\sqrt{15}-\sqrt{5}+3\sqrt{3}-7}{12-1} = \boxed{\frac{2\sqrt{15}-\sqrt{5}+3\sqrt{3}-7}{11}}$$

NOTA 1  
Abbiamo scelto  
questo raggruppamento  
perché così i calcoli  
si prospettano più semplici

NOTA 2  
Invertiamo l'ordine,  
affinché,  
dopo la razionalizzazione,  
si ottenga  
un denominatore positivo

$$85) \frac{\sqrt{60}}{\sqrt{5}-2\sqrt{2}+\sqrt{3}} = \frac{2\sqrt{15}}{(\sqrt{5}+\sqrt{3})-2\sqrt{2}} \cdot \frac{(\sqrt{5}+\sqrt{3})+2\sqrt{2}}{(\sqrt{5}+\sqrt{3})+2\sqrt{2}} = \frac{2\sqrt{15}(\sqrt{5}+\sqrt{3}+2\sqrt{2})}{(\sqrt{5}+\sqrt{3})^2 - (2\sqrt{2})^2} =$$

$$= \frac{2\sqrt{15}(\sqrt{5}+\sqrt{3}+2\sqrt{2})}{\cancel{5+3}+2\sqrt{15}-\cancel{8}} = \boxed{\sqrt{5}+\sqrt{3}+2\sqrt{2}}$$

$$86) \frac{1}{2\sqrt[3]{2} - \sqrt[3]{15}} = \frac{1}{\frac{2\sqrt[3]{2} - \sqrt[3]{15}}{a-b}} \cdot \frac{(2\sqrt[3]{2})^2 + 2\sqrt[3]{2} \cdot \sqrt[3]{15} + (\sqrt[3]{15})^2}{(2\sqrt[3]{2})^2 + 2\sqrt[3]{2} \cdot \sqrt[3]{15} + (\sqrt[3]{15})^2}}{a^2+ab+b^2} =$$

$$= \frac{4\sqrt[3]{4} + 2\sqrt[3]{30} + \sqrt[3]{225}}{\underbrace{(2\sqrt[3]{2})^3 - (\sqrt[3]{15})^3}_{a^3-b^3}} = \frac{4\sqrt[3]{4} + 2\sqrt[3]{30} + \sqrt[3]{225}}{16-15} = \boxed{4\sqrt[3]{4} + 2\sqrt[3]{30} + \sqrt[3]{225}}$$

$$87) \frac{x^2 - 64}{\sqrt[3]{x+2}} = \frac{x^2 - 64}{\sqrt[3]{x+2}} \cdot \frac{\sqrt[3]{x^2} - 2\sqrt[3]{x} + 4}{\sqrt[3]{x^2} - 2\sqrt[3]{x} + 4} = \frac{\cancel{(x+8)}(x-8)(\sqrt[3]{x^2} - 2\sqrt[3]{x} + 4)}{\cancel{x+8}} = \boxed{(x-8)(\sqrt[3]{x^2} - 2\sqrt[3]{x} + 4)}$$

$$88) \frac{3}{2\sqrt[3]{3}} = \frac{3}{2\sqrt[3]{3}} \cdot \frac{\sqrt[3]{3^2}}{\sqrt[3]{3^2}} = \frac{\cancel{3}\sqrt[3]{3^2}}{2 \cdot \cancel{3}} = \boxed{\frac{\sqrt[3]{9}}{2}}$$

o anche:

$$\frac{3}{2\sqrt[3]{3}} = \frac{\sqrt[3]{3} \cdot \sqrt[3]{3} \cdot \cancel{\sqrt[3]{3}}}{2\sqrt[3]{3}} = \boxed{\frac{\sqrt[3]{9}}{2}}$$

$$89) \frac{a-b}{\sqrt[4]{(a-b)^3}} = \frac{a-b}{\sqrt[4]{(a-b)^3}} \cdot \frac{\sqrt[4]{a-b}}{\sqrt[4]{a-b}} = \frac{(a-b)\sqrt[4]{a-b}}{\sqrt[4]{(a-b)^4}} = \frac{\cancel{(a-b)}\sqrt[4]{a-b}}{\cancel{a-b}} = \boxed{\sqrt[4]{a-b}}$$

$$\text{oppure: } \frac{a-b}{\sqrt[4]{(a-b)^3}} = \frac{(\sqrt[4]{a-b})^4}{(\cancel{\sqrt[4]{a-b}})^3} = \boxed{\sqrt[4]{a-b}}$$