$$\left(3-\frac{1}{\sqrt{3}}\right)^2-\left(3+\frac{1}{\sqrt{3}}\right)^2$$

$$\begin{aligned}\left(3-\frac{1}{\sqrt{3}}\right)^2-\left(3+\frac{1}{\sqrt{3}}\right)^2 &= \left(9-2\cdot 3\cdot\frac{1}{\sqrt{3}}+\frac{1}{3}\right)-\left(9+2\cdot 3\cdot\frac{1}{\sqrt{3}}+\frac{1}{3}\right)\\ &= \left(9-\frac{6}{\sqrt{3}}+\frac{1}{3}\right)-\left(9+\frac{6}{\sqrt{3}}+\frac{1}{3}\right)\\ &= 9-\frac{6}{\sqrt{3}}+\frac{1}{3}-9-\frac{6}{\sqrt{3}}-\frac{1}{3}\\ &= -\frac{12}{\sqrt{3}}\\ &= -\frac{12}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}\\ &= -\frac{12\sqrt{3}}{3}\\ &= -4\sqrt{3}\end{aligned}$$

oder analog der Idee in Aufgabe 3:

$$x+y=\left(3-\frac{1}{\sqrt{3}}\right)+\left(3+\frac{1}{\sqrt{3}}\right)=6$$

$$x-y=\left(3-\frac{1}{\sqrt{3}}\right)-\left(3+\frac{1}{\sqrt{3}}\right)=-2\,\frac{1}{\sqrt{3}}=-\frac{2}{\sqrt{3}}$$

damit erhält man:

$$x^2-y^2=(x+y)(x-y)=6\cdot\left(-\frac{2}{\sqrt{3}}\right)=-\frac{12}{\sqrt{3}}$$ weiter wie oben!