

$$\begin{aligned} 6) \text{ e) } (\sqrt{6} - 2\sqrt{3})^2 &= (\sqrt{6})^2 - 2 \cdot \sqrt{6} \cdot 2\sqrt{3} + (2\sqrt{3})^2 \\ &= 6 - 4\sqrt{18} + 4 \cdot 3 \\ &= 18 - 4\sqrt{9 \cdot 2} \\ &= 18 - 4 \cdot 3\sqrt{2} \\ &= 18 - 12\sqrt{2} \end{aligned}$$