

$$(\sqrt{x})^2 = x$$

$$\begin{aligned} \boxed{9} \quad (a) \quad \frac{(\sqrt{x} + \sqrt{3})^2 - (x+3)}{2} &= \frac{x + 2\sqrt{x}\sqrt{3} + 3 - x - 3}{2} = \frac{2\sqrt{x}\sqrt{3}}{2} \\ &= \sqrt{x} \cdot \sqrt{3} = \underline{\underline{\sqrt{3x}}} \end{aligned}$$

$$\begin{aligned} (b) \quad \frac{\lg \sqrt{x} \cdot \lg \left(\frac{x}{2}\right)^2}{\lg \left(\frac{x}{2}\right)} &= \frac{\lg x^{\frac{1}{2}} \cdot 2 \cdot \lg \left(\frac{x}{2}\right)}{\lg \left(\frac{x}{2}\right)} = \frac{1}{2} \cdot \lg x \cdot 2 = \underline{\underline{\lg x}} \end{aligned}$$

$$\lg x^{\frac{1}{2}} = \frac{1}{2} \cdot \lg x$$

$$\lg \left(\frac{x}{2}\right)^2 = 2 \lg \left(\frac{x}{2}\right)$$