4. $h(x) = \dfrac{x^2}{\sqrt{x}+2}$

$= \dfrac{x^2}{x^{\frac{1}{2}}+2}$ $\quad P \quad Q$

$P' = 2x \qquad Q' = \frac{1}{2}x^{\frac{1}{2}-1} = \frac{1}{2}x^{-\frac{1}{2}} = \dfrac{1}{2x^{1/2}}$

$\dfrac{P'Q - PQ'}{Q^2}$

$h'(x) = \dfrac{2x(x^{\frac{1}{2}}+2) - x^2\left(\frac{1}{2x^{1/2}}\right)}{(x^{\frac{1}{2}}+2)^2}$ ← INNER DENOM

$= \dfrac{2x^{\frac{1}{2}} \cdot 2x(x^{\frac{1}{2}}+2) - \frac{x^2}{2x^{1/2}} \cdot 2x^{\frac{1}{2}}}{2(2+2x^{1/2})^2}$

$= \dfrac{4x^{\frac{3}{2}}(x^{\frac{1}{2}}+2) - x^2}{2(2+x^{1/2})^2}$ ← $\frac{4}{2}$

$= \dfrac{x^{\frac{3}{2}}\left[4(x^{\frac{1}{2}}+2) - x^{\frac{1}{2}}\right]}{2(2+x^{1/2})^2}$

$= \dfrac{x^{\frac{3}{2}}(4x^{1/2}+8-x^{1/2})}{2(2+x^{1/2})^2}$

$= \dfrac{x(3x^{1/2}+8)}{2(2+x^{1/2})^2}$

$= \boxed{\dfrac{x(3\sqrt{x}+8)}{2(2+\sqrt{x})^2}}$