Given $g(x)=\sqrt{6x^4+11x^2}$, use the derivative rule for inverse functions to determine $\left(g^{-1}\right)'\left(g(-2)\right)$.

$g^{-1}[g(x)] = x$,

$(g^{-1})'[g(x)] \cdot g'(x) = 1$ so

$(g^{-1})'[g(x)] = \frac{1}{g'(x)}$. Now

$g'(x) = \frac{1}{2\sqrt{6x^4+11x^2}}(24x^3+22x)$

$g'(-2) = \frac{-168}{\sqrt{140}}$. So

$(g^{-1})^{-1}(g(-2)) = \frac{1}{g'(-2)} = -\frac{\sqrt{140}}{168}$.