Questions

1. Find the inverse of the function $f(x) = \sqrt[3]{x+3} - 9$ by reversing a composition. Check your answer by computing $f(f^{-1}(x))$.

2. Find the inverse of the function $f(x) = \sqrt[3]{x+3} - 9$ by the switch-and-solve method. Check your answer by computing $f^{-1}(f(x))$.

3. Find the inverse of the function $f(x) = \dfrac{3x+1}{1-4x}$ by the switch-and-solve method. Check your answer by computing $f^{-1}(f(x))$.

4. If $f(x) = 2x + 1$ and $g(x) = 3x - 5$ verify the equation $(f \circ g)^{-1} = g^{-1} \circ f^{-1}$.

Hint: Find formulas for $f \circ g$, $(f \circ g)^{-1}$, f^{-1}, g^{-1} and $g^{-1} \circ f^{-1}$.