

Some notes from class

2018-01-12

Example problem

Find the inverse of the function $f(x) = 5 \cdot 3^{x+1} - 4$.

Write $x = 5 \cdot 3^{y+1} - 4$, and solve for y .

Then $x + 4 = 5 \cdot 3^{y+1}$, so $\frac{x+4}{5} = 3^{y+1}$.

If we take the base 3 logarithm of both sides, we obtain

$$\log_3 \left(\frac{x+4}{5} \right) = \log_3 (3^{y+1}) = y + 1$$

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$$\begin{aligned}\log_3 \left(\frac{x+4}{5} \right) &= \log_3 (3^{y+1}) = y+1 \\ \log_3 \left(\frac{x+4}{5} \right) - 1 &= y \\ f^{-1}(x) &= \log_3 \left(\frac{x+4}{5} \right) - 1\end{aligned}$$