Linear functions are one-to-one on the entire real line, so because $f(x)$ is linear, it has an inverse. To find it, we solve $y = 5x^3 + 7$ for x:

$$\begin{aligned} & y = 5x^3 + 7 \\ \Rightarrow \quad & y - 7 = 5x^3 \\ \Rightarrow \quad & (y-7)/5 = x^3 \\ \Rightarrow \quad & \sqrt[3]{(y-7)/5} = x. \end{aligned}$$

Swap x & y to get

$$y = \sqrt[3]{\frac{x-7}{5}}.$$

Therefore the inverse to f is

$$f^{-1}(x) = \sqrt[3]{\frac{x-7}{5}}.$$