Given an output, solve for the input algebraically.

Given \( f(x) = x^{\frac{3}{2}} \), for what value of \( x \) is \( f(x) = 125 \)?

\[
X^{\frac{3}{2}} = 125
\]

\[
\sqrt[3]{X^{\frac{3}{2}}} = \sqrt[3]{125}
\]

\[
X^{\frac{1}{2}} = 5
\]

\[
(X^{\frac{1}{2}})^2 = 5^2
\]

\[
X = 25
\]