

Problem 30

If $\log_b(a) \approx 124.6$ and $f(x) = (\sqrt{b})^x$

What is the greatest integer n such that $f(n) < a$?

Answer

249

Explanation

$$\log_b(a) \approx 124.6 \Rightarrow b^{124.6} \approx a$$

$$(\sqrt{b})^{(2)124.6} \approx a \Rightarrow (\sqrt{b})^{249.2} \approx a \Rightarrow (\sqrt{b})^{249} < a < (\sqrt{b})^{250}$$

Thus: $n = 249$