Show all of your work and completely simplify your answer.

Determine a power series for f centered about $x = 2$ if $f(x) = \dfrac{1}{\sqrt[3]{x-3}}$. Write your answer using summation notation, then use it to approximate $f(0)$. How many terms of this infinite series do we need to approximate $f(0)$ accurate to 0.001 units?