> # Define the function
  $f := x \rightarrow x \hat{} 3 :$

  # Compute the Fourier sine coefficients
  $b := n \rightarrow (2 / \text{Pi}) * int(f(x) * \sin(n*x), x = 0 .. \text{Pi}) :$

  # Truncate the sine series to N terms
  $N := 100 :$ # Change N for more terms
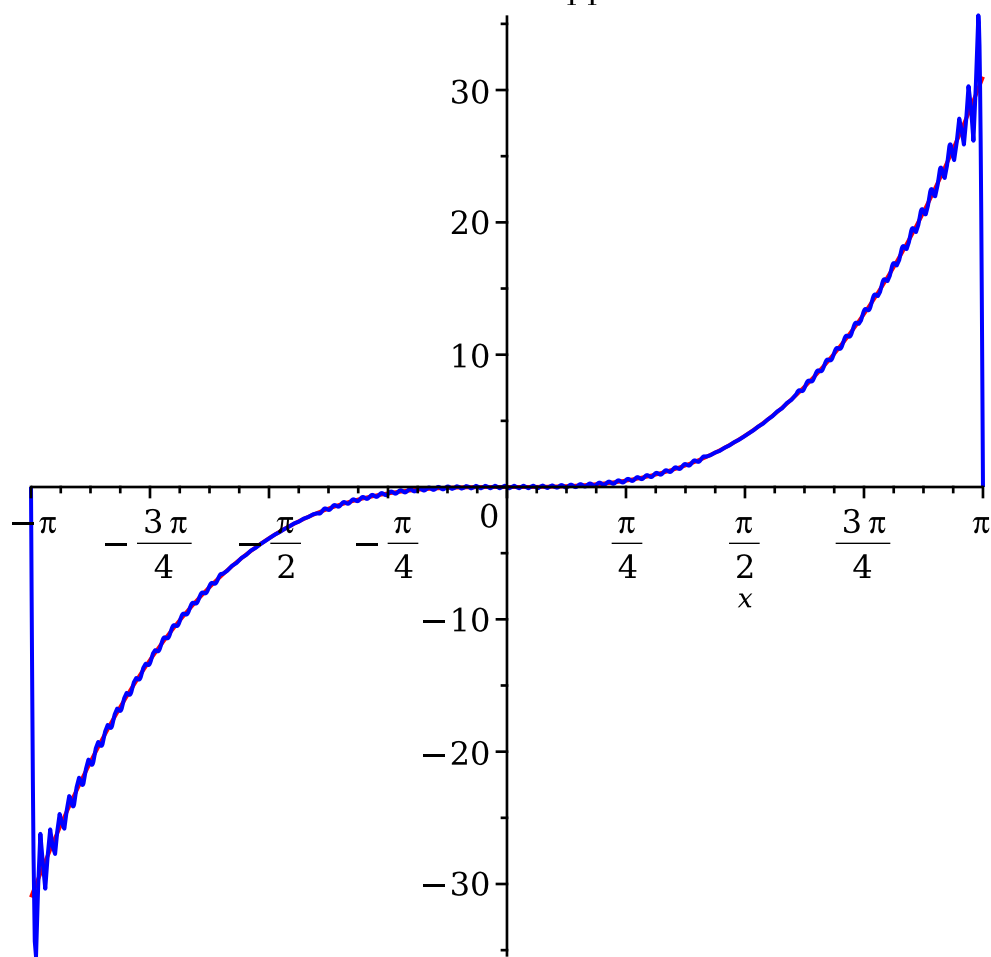 $f\_sine := sum(b(n) * \sin(n*x), n = 1 .. N) :$

  # Plot the original function and the sine series approximation
  $plot([f(x), f\_sine], x = -\text{Pi} .. \text{Pi}, color = [red, blue], title$
      $= $ "Fourier Sine Series Approximation");

Fourier Sine Series Approximation

>