Math 150 Quiz 2 Extra Problem

Solve the equation \( xe^x = 3 \) by the following steps.
(This approach can be extended to find approximate solutions to equations to any degree of accuracy.)

1. Use \( f(x) = xe^x - 3 \) and rewrite the equation as \( f(x) = 0 \), i.e., \( xe^x - 3 = 0 \).
2. Start with the interval \([0, 2]\) and use the IVT to verify that there is a root there.
3. Continue by bisection and iterate to close in on a root. Set up a chart and write down the endpoints of the intervals as you go. Always choose the endpoints so that the function has opposite signs at the endpoints of each interval.
4. For this problem, stop after the 8th step.
(In general, you stop when the length of the interval is within the desired degree of accuracy.)

See the sample problem. Then write your results below (on your printout).