Question **2**

Partially correct

Marked out of 20

(*Regula Falsi Method*). All numerical answers should be rounded to 6-digit floating-point numbers.

Use the Regula Falsi method to find an approximation p_N of the root of the function

$$f(x) = x - \sin(4.221x + 2.139) + 4.221$$

in $[-5, -1]$ satisfying

$$\mathrm{RE}(\tilde{p}_N \approx \tilde{p}_{N-1}) < 10^{-6}.$$

Show your work by filling in the output table below (as with the Bisection method, the column labelled by $f(a_n)f(p_n)$ is for appropriate letter signs +, −; in order to evaluate the (first) relative error associated with the approximation $\tilde{p}_1 \approx \tilde{p}_0$, assume formally that $p_0 = -5$; please enter an asterisk $*$ in each input field in the unnecessary rows):

n	a_n	p_n	b_n	$f(a_n)f(p_n)$	$\mathrm{RE}(\tilde{p}$
1	-5 ✔	-4.44254 ✔	-1 ✔	+ ✔	0.1254 ✔
2	-4.44254 ✔	-3.76231 ✔	-1 ✔	- ✔	0.1808 ✔
3	-4.44254 ✔	-4.15559 ✔	-3.76231 ✔	- ✔	0.0946 ✔
4	-4.44254 ✔	-4.23216 ✔	-4.15559 ✔	+ ✔	0.0180 ✔
5	-4.23216 ✔	-4.2267 ✔	-4.15559 ✔	- ✔	0.0012 ✔
6	-4.23216 ✔	-4.22677 ✔	-4.2267 ✔	+ ✔	1.6561 ✔
7	-4.22677 ✔	-4.22677 ✔	-4.2267 ✔	+ ✖	
8	* ✔	* ✔	* ✔	* ✔	*
9	* ✔	* ✔	* ✔	* ✔	*

Accordingly,

$p_N \doteq$ -4.22677 ✔ .

Check

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