1. For the function *g*(*x*) = *e*−*x*2*/*2 use the centered difference formula with *h* = 10−1*,*10−2 ···10−20 to create a table of estimates of *g*0(1*.*4). Include a column for the relative error of each estimate.

Using the central difference formula, we were able to create the table of estimates of *g*0(1*.*4) below. We can see that an error occurs when *h* is less than or equal to 10−16 because it is causing the central difference formula to divide by a very small number. We can also see that the relative error reaches its lowest point around the fifth iteration when *h* is 10−5 but then the relative error begins to increase again after that.

*g*0(1*.*4) = -0.52543553839195933364

