

A couple numerical limits

Here are a couple of numerical limit problems, like the problems we discussed in our second day of class.

The problems

1. Table 1 below shows some values of $f(x)$ near $x = 3$. Use that table to give your best estimate of $\lim_{x \rightarrow 3} f(x)$. Be sure to provide a number of digits that you can justify and explain your justification.

Table 1

x	$f(x)$
3.1	1.74618943088019
3.01	1.62245912673256
3.001	1.61073375272935
3.0001	1.60956743390228
3.00001	1.60945086395969

2. Let $f(x) = (4^x - 1)/x$. Compute the values of $f(x)$ at

$$x = 0.1, 0.01, 0.001, 0.0001, \text{ and } 0.00001$$

and list those results in a table. Use your table to give your best estimate of

$$\lim_{x \rightarrow 0} \frac{4^x - 1}{x}.$$

Again, be sure to provide a number of digits that you can justify and explain your justification.