1. All of the numbers below are correctly rounded to the number of digits shown. In each case, determine the interval in which the true value of the result must lie.
   (a) 1 + 2 (b) 1.5 − 2 (c) 1.414 × 1.4142 (d) 1.41/2.00 (e) cos 1.00 (f) ln 2.00.

2. Show that the equality \((x + y) + z = x + (y + z)\) may fail on a three-digit decimal computer □□□.

3. In three-digit decimal arithmetic □□□, which value of \(x > 0\) makes
   \[\Delta(x) = 0.50 - \frac{\sqrt{1 + x} - 1}{x}\] an a minimum?

4. Evaluate the polynomial \(p(x) = 1 - \frac{1}{2} x^2 + \frac{1}{24} x^4\) at \(x = z\) using as few operations as you can.

5. Find the quotient and remainder of the division of \(f(x) = x^8 + x^6 + x^4 + x^2 + 1\) by \(g(x) = x + 1\).

6. (Extra) Given \(N = 2, 3, 4, \ldots\), use a computer to determine all rational approximations \(\frac{p}{q}\) to \(\alpha = \frac{\sqrt{5} - 1}{2}\) such that \(q < N\) and \(|p - \alpha q| < 1/N\). What do you notice?