- 1. Convert the following base-2 numbers to decimal: $1011.\overline{010}$, $11.101\overline{01}$.
- 2. Sauer, page 16, Exercise 16a. Also find the machine representation of the number in hex, and compare with Matlab's answer.
- 3. Sauer, page 19, Computer Problem 5.
- 4. Write a MATLAB function to solve the quadratic equation $ax^2 + bx + c = 0$, using the classical quadratic formula $x_{\pm} = (-b \pm \sqrt{b^2 4ac})/(2a)$.
- (a) Test your function on the following cases:

(i)
$$a = 2, b = 3, c = 1,$$

(ii)
$$a = 1, b = 3, c = 4.$$

In each case and for each choice of sign, verify the accuracy of the numerical solution by comparing it with the exact solution.

(b) Now consider the case

(iii)
$$a = 1, b = 3, c = 8^{-14}$$
.

One solution is $x_- \simeq -3$. Test your MATLAB script on case (iii). It should perform poorly, so modify it to obtain accurate approximate roots. Finally, use MATLAB to make a table which displays three sets of roots for case (iii), those calculated with your original function, your modified function, and MATLAB's internal roots function.