Remember to adequately label all plots and include any MATLAB scripts and functions with your solutions. A clear and complete presentation of your solutions is required for full credit.

1. Convert the following base-2 numbers to decimal: $1011.\overline{011}$, $11.101\overline{10}$.

2. Sauer, Section 0.3, Exercises 1(b), 1(c), 8.

3. Sauer, Section 0.4, Computer Exercise 3.

4. Write a MATLAB function to solve the quadratic equation $ax^2 + bx + c = 0$ using the classical quadratic formula
$$x_{\pm} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$
   (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 choice of sign, verify the accuracy of the numerical solution by comparing it with the exact solution.

   (b) Now consider the case $a = 1$, $b = 3$, $c = 8^{-14}$. One solution is $x_- \approx -3$. Test your function on this case. It should perform poorly, so modify it as described in Example 0.6 to obtain accurate approximate roots. Finally, make a table which displays three sets of roots for this case: those calculated with your original function, those calculated with your modified function, and those calculated with MATLAB's built-in `roots` function.