1. Evaluate the general continued fractions
   a. \[ 3 + \frac{2}{6 + \frac{2}{3}} \]
   b. \[ 2 + \frac{3}{1 + \frac{2}{5}} \]

2. Convert the following rational numbers into simple continued fractions.
   a. \( \frac{6}{17} \) b. \( \frac{50}{79} \) c. \( \frac{100}{117} \)

3. Express as a quadratic irrationality the following infinite continued fraction.
   a. \[ x = [1, 4, 1, 4, 1, 4, 1, 4, \ldots] \]
      where 1, 4 repeat for ever.
   b. \[ x = [2, 3, 4, 2, 3, 4, 2, 3, 4, \ldots] \]
      where 2, 3, 4 repeat for ever.

4. Find a representation in the form \( a + b\sqrt{Q} \) for rational numbers \( a \) and \( b \) and positive integer \( Q \),
   for the following infinite, ultimately periodic, continued fractions \( x \).
   (Hint: you should use what you got in problem 3.)
   a. \[ x = [5, 1, 4, 1, 4, 1, 4, 1, 4, \ldots] \]
      where 1, 4 repeat for ever.
   b. \[ x = [5, 1, 2, 3, 4, 2, 3, 4, 2, 3, 4, \ldots] \]
      where 2, 3, 4 repeat for ever.

5. a. Convert \( \sqrt{5} \) into an ultimately periodic continued fraction.
   b. Convert \( \sqrt{3} \) into an ultimately periodic continued fraction.