Problem 1
Evaluate the sum
\[ \sum_{n=1}^{1994} \frac{(-1)^n n^2 + n + 1}{n!}. \]

Problem 2
Show that every positive integral power of \( \sqrt{2} - 1 \) is of the form \( \sqrt{m} - \sqrt{m-1} \) for some positive integer \( m \). (e.g. \( (\sqrt{2} - 1)^2 = 3 - 2\sqrt{2} = \sqrt{5} - \sqrt{3} \)).

Problem 3
Twenty-five men sit around a circular table. Every hour there is a vote, and each must respond yes or no. Each man behaves as follows: on the \( n \)th vote, if his response is the same as the response of at least one of the two people he sits between, then he will respond the same way on the \( (n + 1) \)th vote as on the \( n \)th vote; but if his response is different from that of both his neighbours on the \( n \)-th vote, then his response on the \( (n + 1) \)-th vote will be different from his response on the \( n \)th vote. Prove that, however everybody responded on the first vote, there will be a time after which nobody’s response will ever change.

Problem 4
Let \( AB \) be a diameter of a circle \( \Omega \) and \( P \) be any point not on the line through \( A \) and \( B \). Suppose the line through \( P \) and \( A \) cuts \( \Omega \) again in \( U \), and the line through \( P \) and \( B \) cuts \( \Omega \) again in \( V \). (Note that in case of tangency \( U \) may coincide with \( A \) or \( V \) may coincide with \( B \).) Also, if \( P \) is on \( \Omega \) then \( P = U = V \). Suppose that \( |PU| = s|PA| \) and \( |PV| = t|PB| \) for some nonnegative real numbers \( s \) and \( t \). Determine the cosine of the angle \( \angle APB \) in terms of \( s \) and \( t \).

Problem 5
Let \( ABC \) be an acute angled triangle. Let \( AD \) be the altitude on \( BC \), and let \( H \) be any interior point on \( AD \). Lines \( BH \) and \( CH \), when extended, intersect \( AC \) and \( AB \) at \( E \) and \( F \), respectively. Prove that \( \angle EDH = \angle FDH \).