1. In how many different ways can $100.00 be made from 5-cent, 10-cent and 25-cent coins if it is required that exactly 1000 coins are used?

2. In triangle $ABC$, let $P$ be the point on side $CB$ satisfying $CP = (1/2)CB$ and let $Q$ be the point on side $CA$ with $CQ = (1/3)CA$. Draw the lines $AP$ and $BQ$, as indicated and suppose these lines meet at the point $X$. Find the ratio of the area of $\triangle ABX$ to the area of $\triangle ABC$.

3. Let $x$ and $y$ be nonzero real numbers satisfying the equation $x + 6/x = 2y + 3/y$. If $x/y \neq 2$, find the product $xy$.

4. Let $F_1 = 1$, $F_2 = 1$, $F_3 = 2$, $F_4 = 3$, $F_5 = 5$, and in general, $F_n = F_{n-1} + F_{n-2}$ for all $n \geq 3$. (This is the famous Fibonacci sequence.) Show that $F_n/F_{n-1} < 1.7$ for all $n \geq 4$.

5. Find all positive integers $n$ such that $n^2 + 25n + 19$ is a perfect square.

You are invited to submit a solution even if you get just one problem. Please do not write your solutions on the problem set page. Remember that solutions usually require a proof or justification.