Practice Problem 2.35

1. Show that $x \cdot y$, the integer product of x and y, can be written in the form $x \cdot y = p + t2^w$, where $t \neq 0$ if and only if the computation of p overflows.
2. Show that p can be written in the form $p = x \cdot q + r$, where $|r| < |x|$.
3. Show that $q = y$ if and only if $r = t = 0$.