Modulo Arithmetic

Definition 1 (Modulo) *For $a, b \in \mathbb{Z}$, $a \equiv b$ mod k iff $k|(b-a)$.*

Perform all arithmetic in this assignment mod 5.

1. Practice arithmetic.
   (a) Evaluate $f(n) = 3n + 1$ for $n = 0, 1, \ldots, 4$.
   (b) Graph $f(n)$. Note your "plane" consists of the 25 points $\{(m, n)|m, n \in 0, 1, 2, 3, 4\}$.
   (c) Evaluate $q(n) = 3n^2 + 2n + 4$ for $n = 0, 1, \ldots, 4$.
   (d) What are the roots of $q(n)$ (i.e., $q(n) = 0$ for which n)?
2. Why are they equivalent?
   (a) Evaluate $f(n) = 3n + 1$ for $n = 5, 6, \ldots, 9$.
   (b) Graph $f(n)$.
   (c) Evaluate $g(n) = 8n - 4$ for $n = 0, 1, \ldots, 4$.
   (d) Graph $g(n)$.
   (e) Compare all three graphs.
   (f) Pick one one of the roots of $q(n)$. Evaluate $q(n)$ for five n that are equivalent to the root.
   (g) Compare these results.